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# Ürək çatışmazlığı xəstələrində cihaz müalicəsi

23.09.2023

Naxçıvan



# Nəyə görə cihaz müalicəsi?

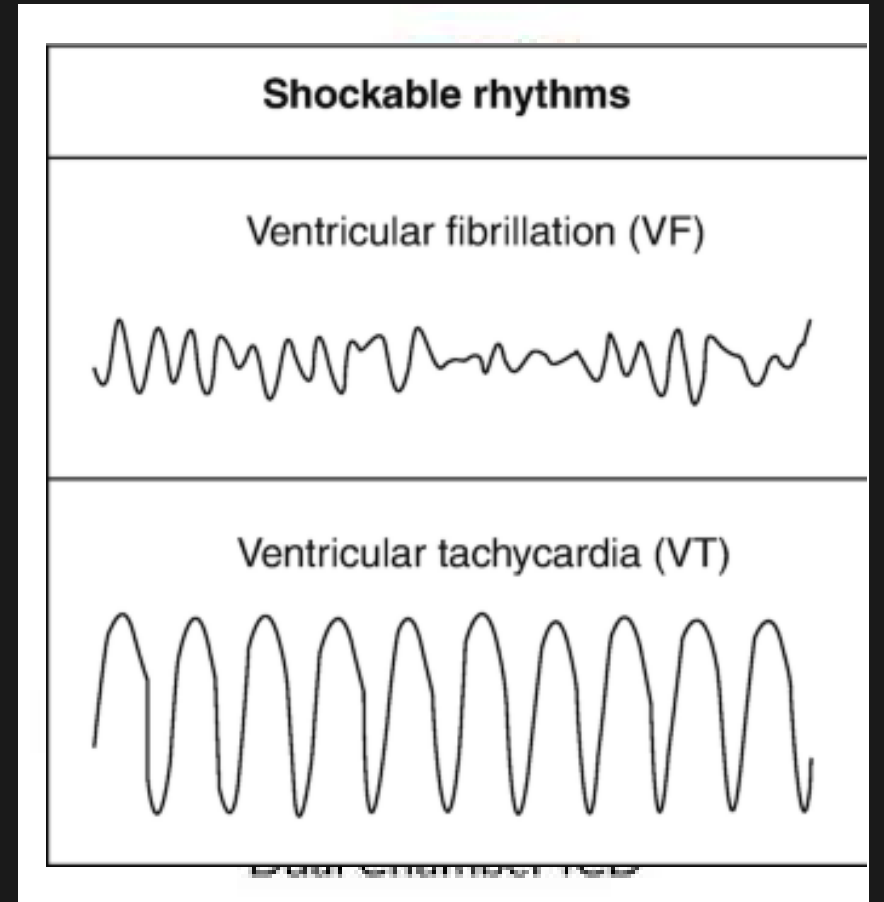
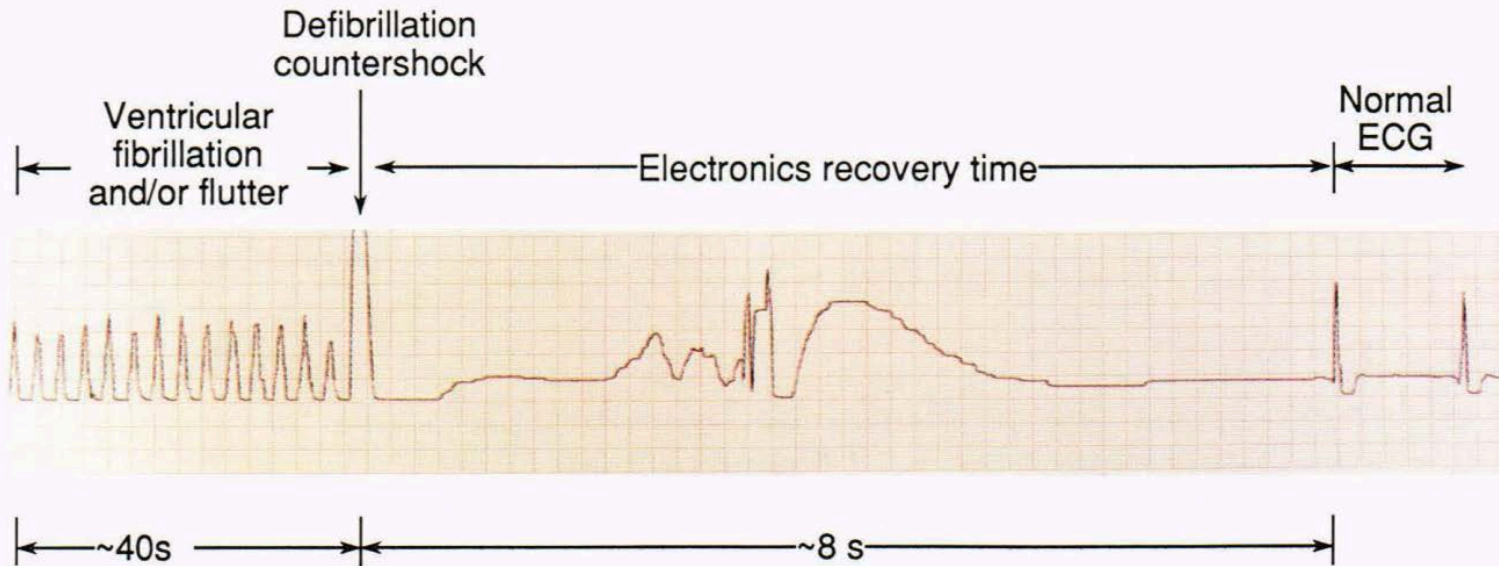
- Ürək çatışmazlığı
  - ~50% = bədxassəli aritmiya
  - Mədəcik taxikardiyası
  - Mədəcik fibrilyasiyası





# 1-ci cihazımız - ICD

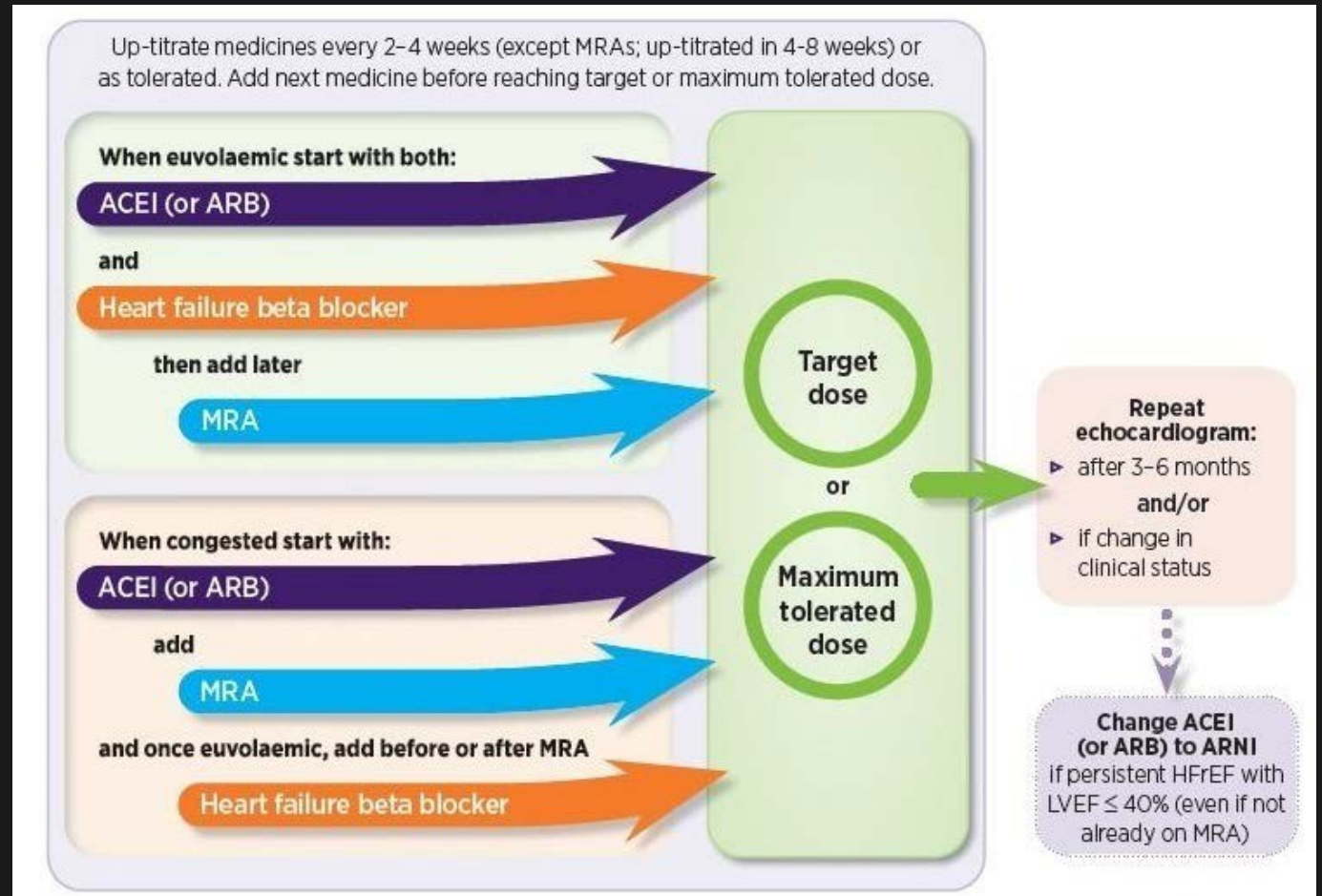
- Implantable Cardioverter Defibrillator
- Bədxassəli aritmiyaları kardioversiya etmək
- 40-80 Coul enerji





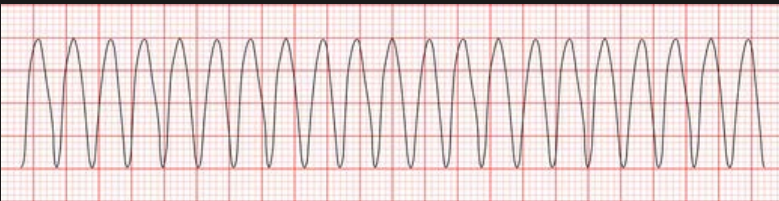
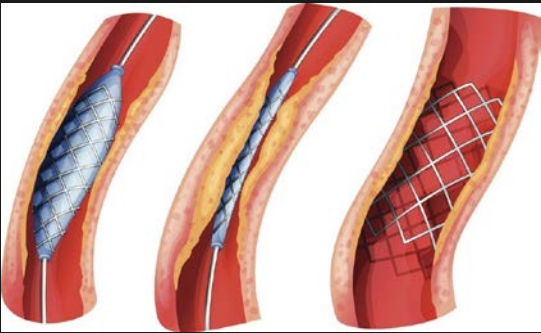
# Optimal dərman müalicəsi

- ARNi; (AÇF/ARB)
- Beta blokator
- MRA
- SGLT2i
- Dozaları titirlənməlidir





# Kæskin miokard infarkt



## Secondary prevention

An ICD is recommended to reduce the risk of sudden death and all-cause mortality in patients who have recovered from a ventricular arrhythmia causing haemodynamic instability, and who are expected to survive for >1 year with good functional status, in the absence of reversible causes or unless the ventricular arrhythmia has occurred <48 h after a MI.<sup>162–164</sup>

I

A

○ EF 35%

○ ICD?



# Keçirilmiş miokard infarktı

- 1 ay əvvəl STEMI
- LAD 1 stent
- EF: 35%
- Heçbir aritmiya izlənməyib
- Suboptimal dərman müalicəsi

## 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  $\leq 35\%$  despite  $\geq 3$  months of OMT, provided they are expected to survive substantially longer than 1 year with good functional status.<sup>161,165</sup>

I

A

ICD implantation is not recommended within 40 days of a MI as implantation at this time does not improve prognosis.<sup>177,178</sup>

III

A



# Qeyri-işemik etiologiyalı ÜÇ

- İfrat alkoqol qəbul edən xəstə
- Sol mədəcik geniş, qlobal
- EF: 20%
- Ciddi tənəffəslik
- Heçbir aritmiya izlənməyib
- Dərman içmir

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  $\leq 35\%$  despite  $\geq 3$  months of OMT, provided they are expected to survive substantially longer than 1 year with good functional status.<sup>161,166,167</sup>

**IIa**

**A**



# ODM + ciddi simptomlu (NYHA IV)

- EF: 20%
- Optimal dərman müalicəsi
- Ciddi şikayətləri davam edir

ICD therapy is not recommended in patients in NYHA class IV with severe symptoms refractory to pharmacological therapy unless they are candidates for CRT, a VAD, or cardiac transplantation. <sup>179–183</sup>

III

C

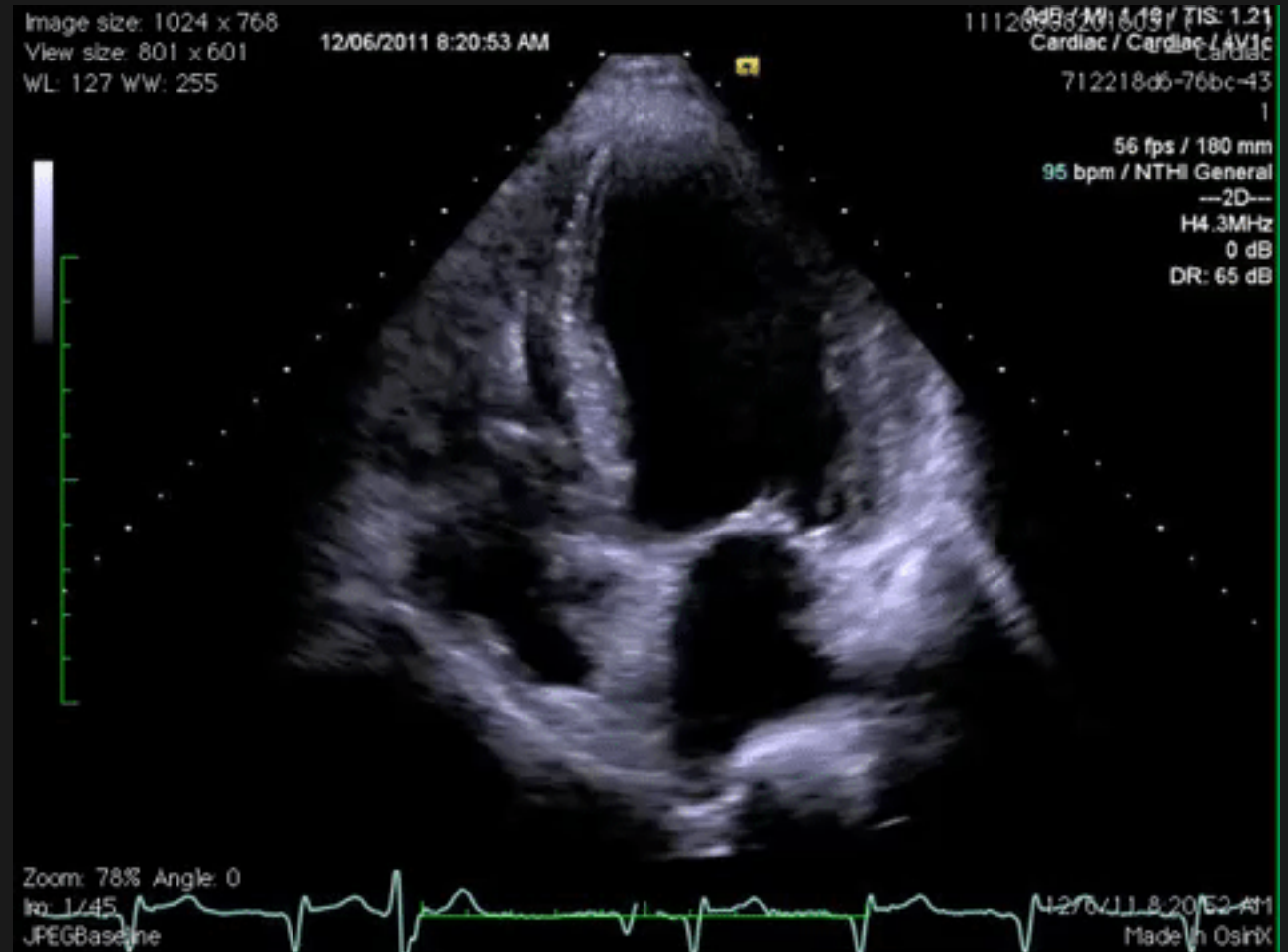
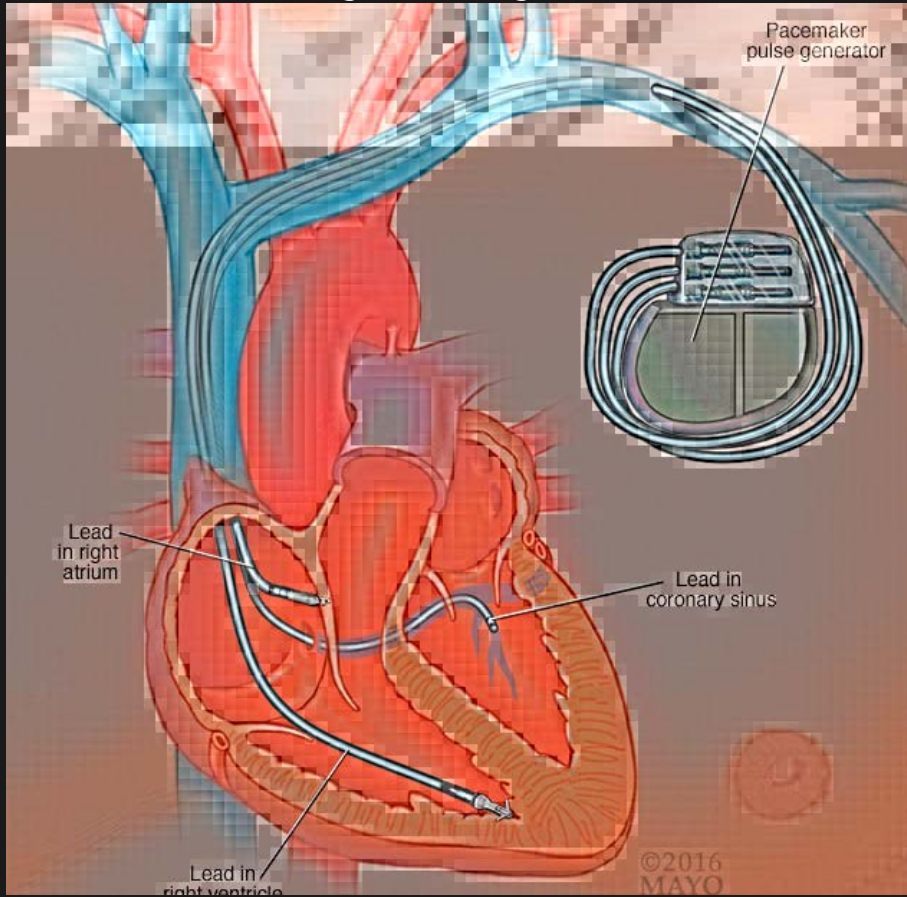
## Ürək çatışmazlığı > Aritmiya





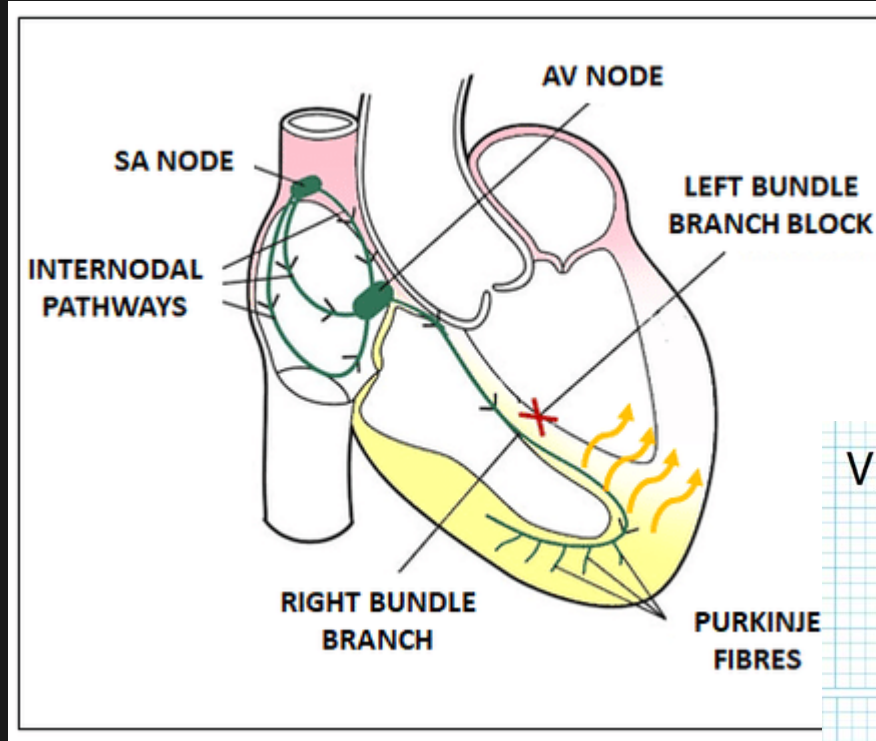
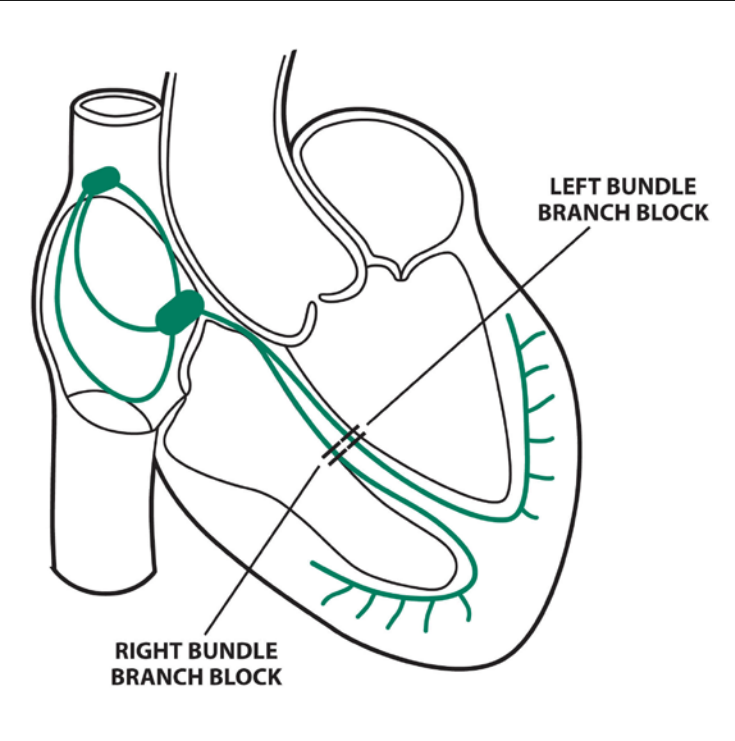
# Digər cihazımız: CRT – nəyə görə?

## ○ Cardiac Resynchronisation Therapy

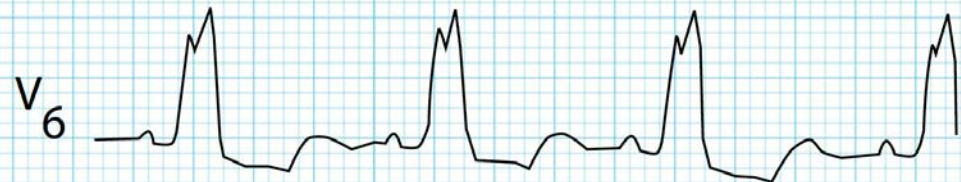




# His d st sinin sol ayaqciđının tam blokadası



- QRS geniřlenir
- Dissinxroniya yaranır





# His d st sinin sol ayaqcıđının tam blokadası

- EF: 30%
- Suboptimal d rman m alic si
- LBBB, (QRS 150ms)
- CRT?

CRT is recommended for symptomatic patients with HF in SR with a QRS duration  $\geq 150$  ms and LBBB QRS morphology and with LVEF  $\leq 35\%$  despite OMT in order to improve symptoms and reduce morbidity and mortality.<sup>205–215</sup>



# Digər geniş QRS (non-LBBB)

- QRS >150ms
- Non-LBBB
- ODM
- EF < 35%

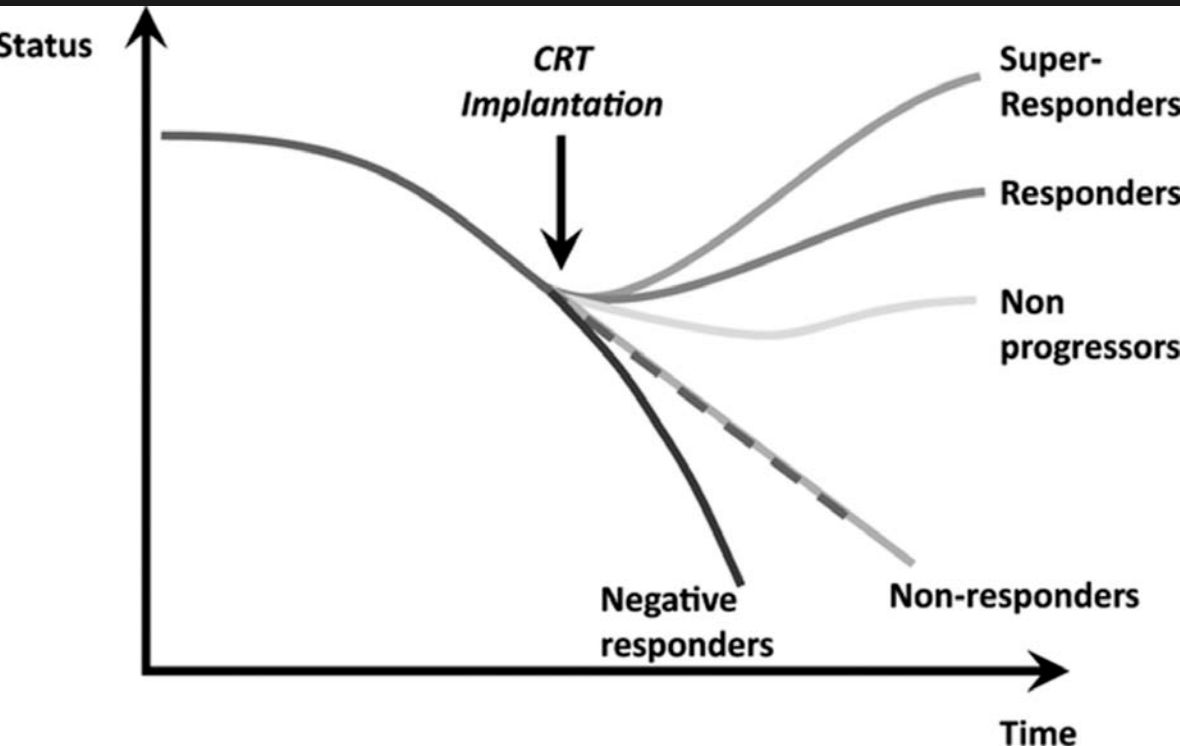
CRT should be considered for symptomatic patients with HF in SR with a QRS duration  $\geq 150$  ms and non-LBBB QRS morphology and with LVEF  $\leq 35\%$  despite OMT in order to improve symptoms and reduce morbidity and mortality.<sup>205–215</sup>

**IIa**



# His dəstəsinin sol ayaqciğının tam blokadası

## QRS 130-150ms

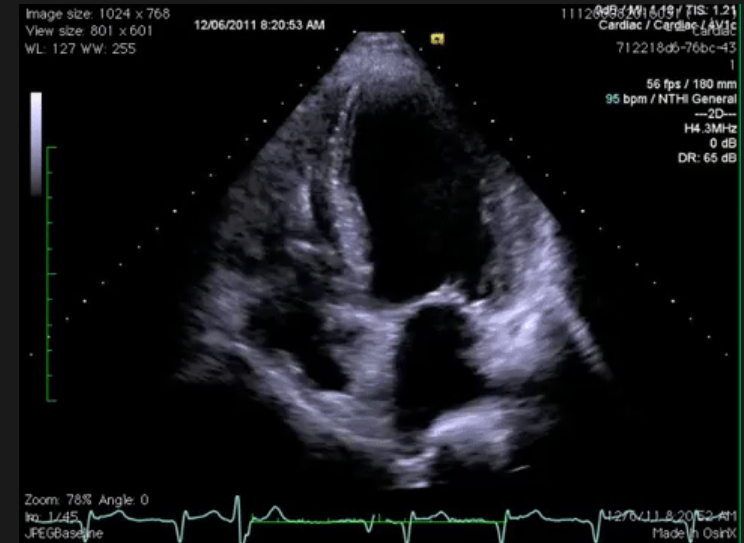


CRT should be considered for symptomatic patients with HF in SR with a QRS duration of 130–149 ms and LBBB QRS morphology and with LVEF  $\leq 35\%$  despite OMT in order to improve symptoms and reduce morbidity and mortality.<sup>211,220</sup>

Ila



# The Cardiac Resynchronization Heart Failure CARE-HF trial



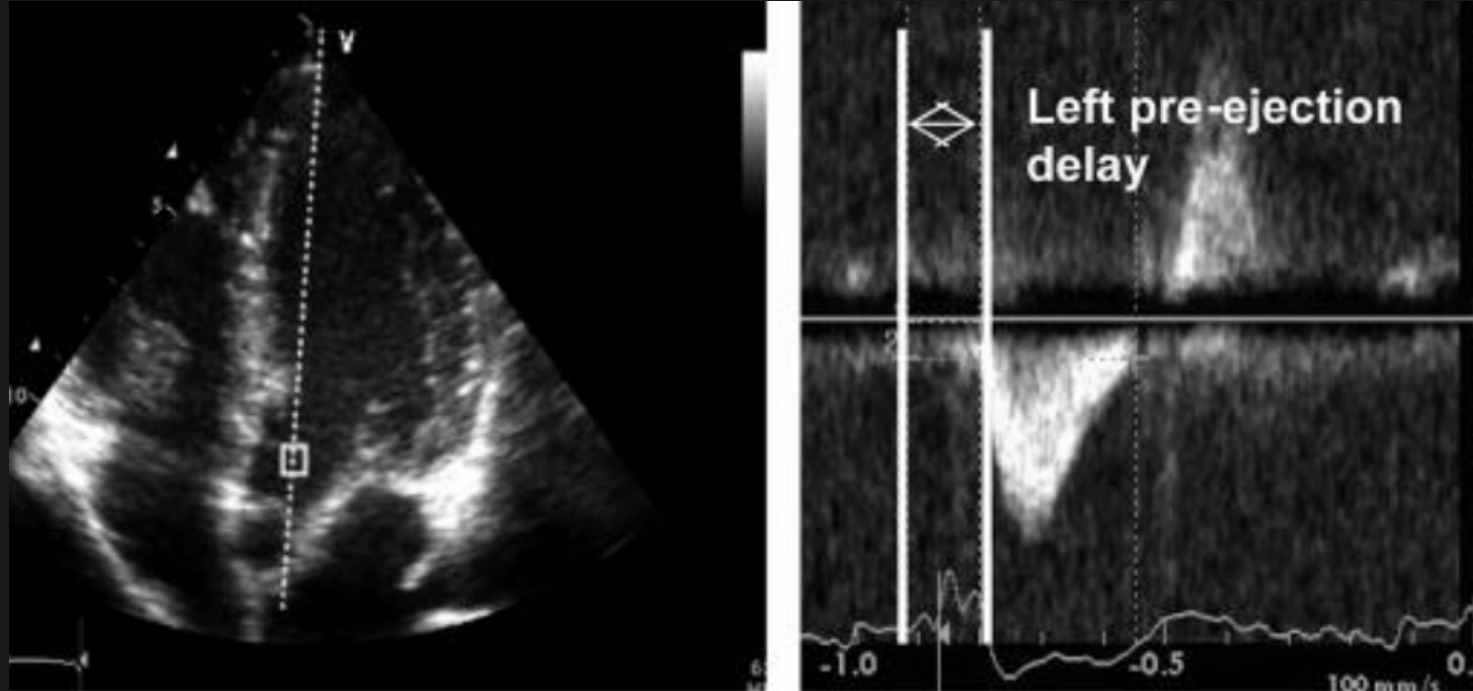
## METHODS

Patients with New York Heart Association class III or IV heart failure due to left ventricular systolic dysfunction and cardiac dyssynchrony who were receiving standard pharmacologic therapy were randomly assigned to receive medical therapy alone or with cardiac resynchronization. The primary end point was the time to death from any cause or an unplanned hospitalization for a major cardiovascular event. The principal secondary end point was death from any cause.



# Cardiac dyssynchrony

- aortic preejection delay(>140 ms)
- interventricular mechanical delay(>40 ms)
- delayed activation of the posterolateral





# The Cardiac Resynchronization Heart Failure CARE-HF trial

interval, 0.48 to 0.85;  $P < 0.002$ ). As compared with medical therapy, cardiac resynchronization reduced the interventricular mechanical delay, the end-systolic volume index, and the area of the mitral regurgitant jet; increased the left ventricular ejection fraction and improved symptoms and the quality of life ( $P < 0.01$  for all comparisons).

## CONCLUSIONS

In patients with heart failure and cardiac dyssynchrony, cardiac resynchronization improves symptoms and the quality of life and reduces complications and the risk of death. These benefits are in addition to those afforded by standard pharmacologic therapy. The implantation of a cardiac-resynchronization device should routinely be considered in such patients.





# His d st sinin sađ ayaqcıđının tam blokadası

Review

> Heart Rhythm. 2011 Jul;8(7):1083-7. doi: 10.1016/j.hrthm.2011.01.041. Epub 2011 Feb 4.

## Cardiac resynchronization therapy in patients with left ventricular systolic dysfunction and right bundle branch block: a systematic review

**Results:** A total of 112 references were retrieved. Four publications from five studies reported data on patients with RBBB and were included in this investigation, with 259 patients randomized to CRT and 226 randomized to non-CRT. None of the available data showed more favorable outcomes (soft or hard) in patients with CRT.



# NYHA IV, Inotrop + CRT?

Meta-Analysis

> JACC Heart Fail. 2018 Sep;6(9):734-742. doi: 10.1016/j.jchf.2018.02.016.

Epub 2018 Aug 8.

## Cardiac Resynchronization Therapy in Inotrope-Dependent Heart Failure Patients: A Systematic Review and Meta-Analysis

**Results:** The pooled analysis demonstrated that 93% of the reported patients (95% confidence interval: 86% to 100%) were weaned from inotropic support after CRT, and the overall 12-month survival rate was 69% (95% confidence interval: 56% to 83%).

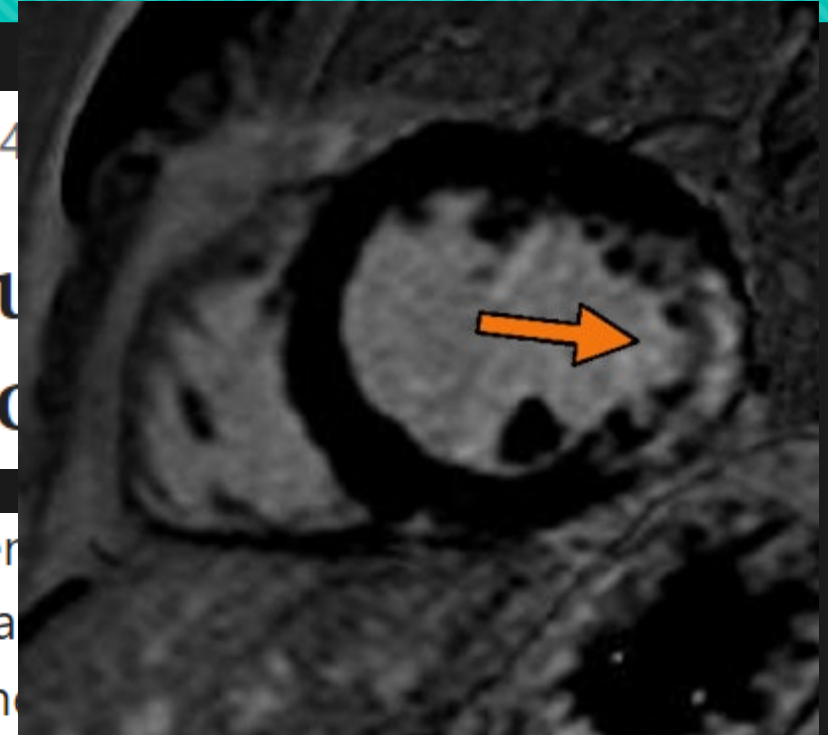


# Keçirilmiş miokard infarktı + geniş QRS

> J Nucl Med. 2012 Jan;53(1):47-54. doi: 10.2967/jnumed.111.09544

## Impact of myocardial scarring on outcome of cardiac resynchronization therapy: extent of

**Results:** A total of 651 scar segments was identified in 213 patients. Scar segments were located in the LV anterior, posterior, septal, and lateral wall. Only 11% of LV leads were positioned in the lateral wall. Myocardial scarring was significantly higher in nonresponders than in responders (18.0% vs. 6%,  $P = 0.001$ ). Compared with patients with scarring  $>22\%$ , patients  $\leq 70$  y with scarring  $\leq 22\%$  of the left ventricle had a greater increase in LV ejection fraction ( $10.1\% \pm 10.5\%$  vs.  $0.8\% \pm 6.1\%$ ;  $P < 0.001$ ) and improvement in NYHA class ( $-0.9 \pm 0.7$  vs.  $-0.5 \pm 0.8$ ;  $P = 0.02$ ).





# CRT – cinsiyyətə görə effektivliyi

- Eyni QRS müddətli – qadın və kişi
- Sol mədəcik kütləsi həcmi az
- Qadınlarda - dissiyoxroniya əlamətləri



47% ♀

CRT Response Score for **Women**

33% ♂

CRT Response Score for **Men**



# Qeyri-işemik + QRS geniş

Clinical Trial

> Pacing Clin Electrophysiol. 2003 Jan;26(1P2):175-80.

doi: 10.1046/j.1460-9592.2003.00011.x.

## Is the outcome of cardiac resynchronization therapy related to the underlying etiology?

*groups showed that patients in the non-CAD group had a significantly greater increase in LVEF ( $P = 0.007$ ) and decrease in NYHA class ( $P < 0.05$ ). Patients with CAD or non-CAD significantly improved clinically during CRT. Non-CAD patients had a greater increase in LVEF and decrease in NYHA functional class than patients with CAD. (PACE 2003; 26[Pt. II]:175–180)*



# Lidin yerləşməsinə görə CRT effektivliyi

## Left Ventricular Lead Position and Clinical Outcome in the Multicenter Automatic Defibrillator Implantation Trial–Cardiac Resynchronization Therapy (MADIT-CRT) Trial

Originally published 7 Mar 2011 | <https://doi.org/10.1161/CIRCULATIONAHA.110.000646> | Circulation. 2011;123:1159–1166

bundle-branch block) with a follow-up of  $29 \pm 11$  months. The extent of cardiac resynchronization therapy benefit was similar for leads in the anterior, lateral, or posterior position ( $P=0.652$ ). The apical lead location compared with leads located in the nonapical position (basal or midventricular region) was associated with a significantly increased risk for heart failure/death (hazard ratio=1.72; 95% confidence interval, 1.09 to 2.71;  $P=0.019$ ) after adjustment for the clinical covariates. The apical lead position was also associated with an increased risk for death (hazard ratio=2.91; 95% confidence interval, 1.42 to 5.97;  $P=0.004$ ).



# Sol qulaqciq həcm indeksinə görə CRT

[Arch Med Sci.](#) 2022; 18(4): 930–938.

PMCID: PMC9266875

Published online 2020 Jan 10. doi: [10.5114/aoms.2019.91511](https://doi.org/10.5114/aoms.2019.91511)

PMID: [35832708](https://pubmed.ncbi.nlm.nih.gov/35832708/)

## Left atrial volume index predicts response to cardiac resynchronisation therapy: a systematic review and meta-analysis



enrolled in 10 studies with mean follow-up duration of 10.5 months were included. The pooled analysis showed that CRT responders had lower baseline LAVI, with a weighted mean difference (WMD) of  $-5.89\%$  (95% CI:  $-10.14$  to  $-1.64$ ). At follow-up, LAVI fell in the CRT responders (WMD  $-4.36\%$ , 95% CI:  $-3.54$  to  $-5.18$ ) compared to non-responders (WMD  $1.45\%$ , 95% CI:  $-0.75$  to  $3.65$ ,  $p = 0.20$ ). The response to CRT in the CRT responders was related to the fall in LVESV.  $\beta = -1.02$  ( $-1.46$  to  $-0.58$ ),  $p = 0.001$ . A baseline LAVI  $< 34$  was associated with a greater response with summary sensitivity  $0.80$  (0.53–0.95), specificity  $0.74$  (0.53–0.95),  $p < 0.001$ .

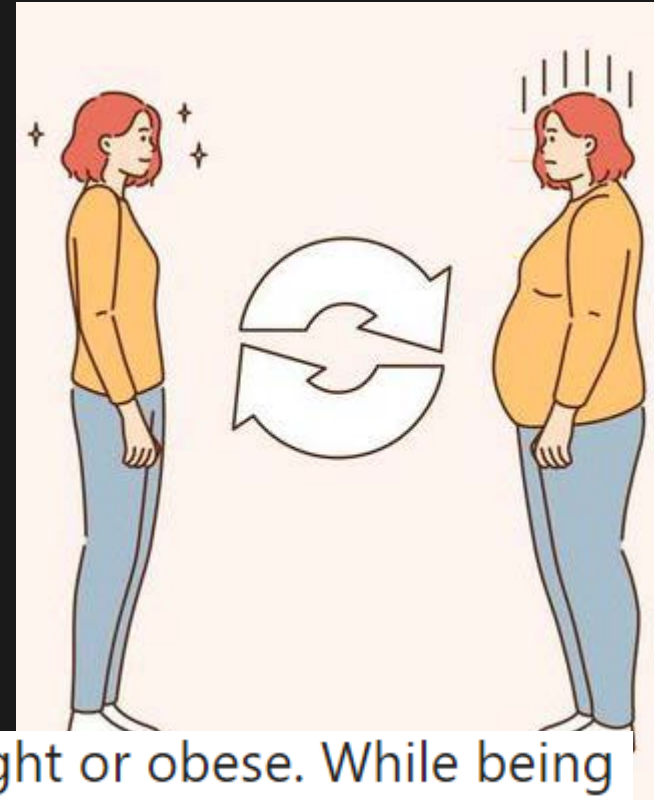


# Obezitė paradoksu

> Eur J Heart Fail. 2019 Sep;21(9):1093-1102. doi: 10.1002/ejhf.1552. Epub 2019 Jul 29.

## Body mass index and outcomes of cardiac resynchronization with implantable cardioverter-defibrillator therapy in older patients with heart failure

**Conclusion:** Most elderly patients with HF receiving CRT-D were overweight or obese. While being underweight was associated with greater risks of death and hospitalization, overweight and obese patients were at lower risk of death after CRT-D.

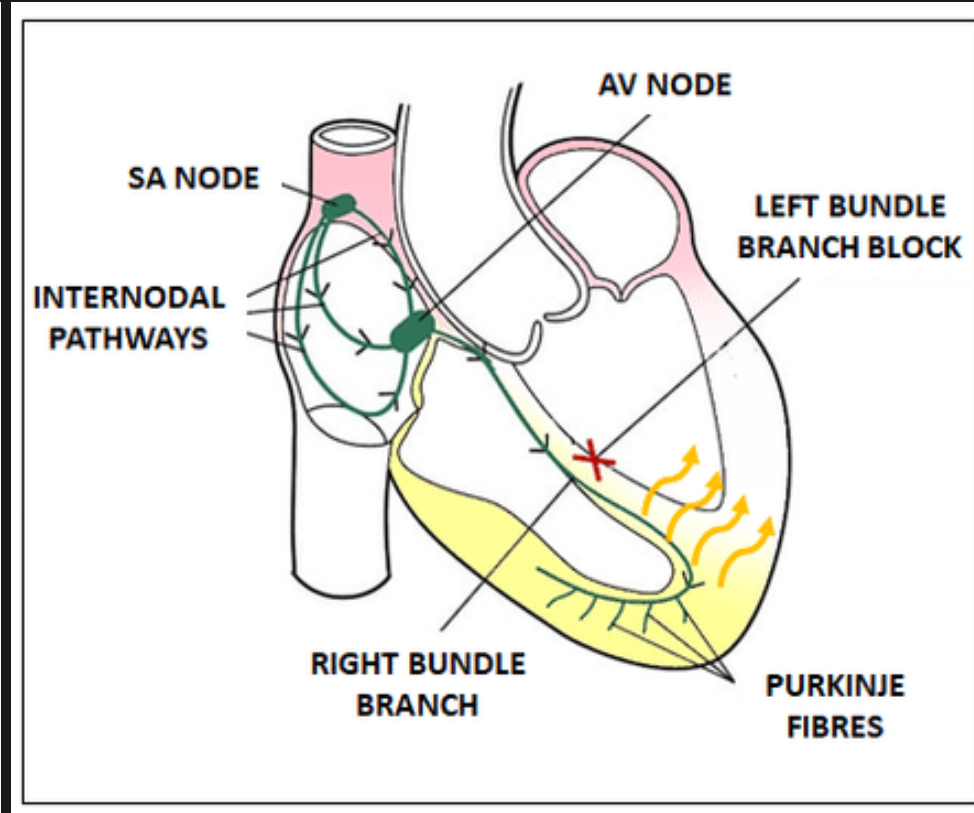
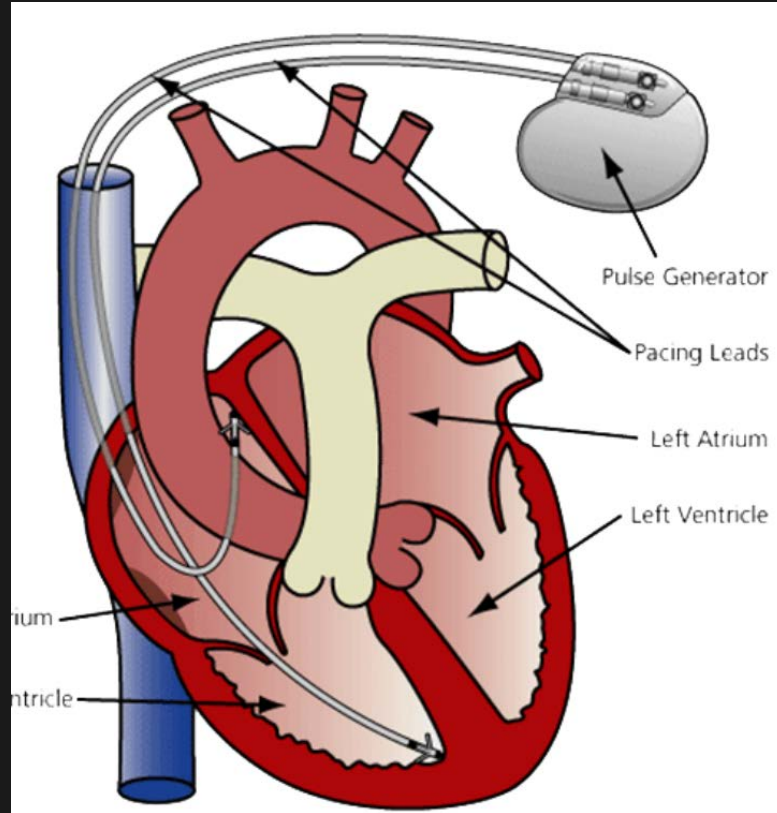






# Tam AV blokada + ÜÇ

- EF: 30%
- Optimal dərman müalicəsi
- QRS normal
- Tam AV blok
- ÜVS 30-40
- Hansı cihaz?





# Tam AV blokada

- EF: 30%
- Optimal dərman müalicəsi
- QRS normal
- Tam AV blok
- ÜVS 30-40
- Hansı cihaz?

CRT rather than RV pacing is recommended for patients with HFrEF regardless of NYHA class or QRS width who have an indication for ventricular pacing for high degree AV block in order to reduce morbidity. This includes patients with AF.<sup>216–219</sup>

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Patients with an LVEF  $\leq 35\%$  who have received a conventional pacemaker or an ICD and subsequently develop worsening HF despite OMT and who have a significant proportion of RV pacing should be considered for 'upgrade' to CRT.<sup>221</sup>

IIa



# QRS < 130 + Exoda dissinxroniya

## Cardiac-Resynchronization Therapy in Heart Failure with a Narrow QRS Complex

The trial was stopped early due to futility with a potential for harm. The primary outcome (all-cause mortality or hospitalization for worsening CHF) was similar between the CRT and control arms (28.7% vs. 25.2%, hazard ratio [HR] 1.20, 95% confidence interval [CI] 0.92-1.57,  $p = 0.15$ ). CHF hospitalization was also similar (24.5% vs. 22.2%,  $p = 0.25$ ), but all-cause mortality was higher in the CRT arm (11.1% vs. 6.4%,  $p = 0.02$ ). This appeared to be driven by cardiovascular causes (9.2% vs. 4.2%,  $p = 0.004$ ). There were no differences in NYHA class or quality of life (QOL) scores between the two arms.



# Evə mesajımız – ICD üçün

- 50% ÜÇ – bədxassəli aritmiya
- Optimal dərman müalicəsi – 3 ay
- Kəskin Mİ – >48 saat – ikincili qoruma
- Keçirilmiş Mİ >40gün və ya 3 ay ODM
- Qeyri-işemik ÜÇ + 3ay ODM
- NYHA IV+ciddi simptom => ÜÇ > aritmiya



# Evə mesajımız – CRT üçün

- LBBB + QRS $\geq$ 150 ms
  - CRT
- RBBB + QRS $\geq$ 150 ms
  - X
- QRS: 130-150ms = Effektivliyi daha yüksəkdir...
  - Exo – dissinxroniya əlamətləri
  - Çapıq toxuması < 22%
  - Qadınlar > Kişilər
  - Qeyri-işemik
  - Telin (Lidin) yerləşdirilməsi = apikal əleyhinə
  - Sol qulaqcıq həcmi = LAVi<34
- QRS<130 + Exo dissinxroniya
  - X



Təşəkkürlər!

