ISRAEL HEART SOCIETY האיגוד הקרדיולוגי בישראל
החוג הישראלי לקיצוב ואלקטרופיזיולוגיה
THE ISRAELI WORKING GROUP ON PACING AND ELECTROPHYSIOLOGY

# Sex Differences in Implantable Cardioverter Defibrillator (ICD) Implantation indications and outcomes

Guy Amit, MD; Mahmoud Suleiman, MD; Mark Kazatsker, MD; Israel Shetboun, MD; Yuval Konstantino, MD; David Luria, MD; Natalie Gevrielov-Yusim, MSc; Ilan Goldenberg, MD; and Michael Glikson, MD. On behalf of the Israeli Working Group on Pacing and Electrophysiology.

National ICD Registry

# BACKGROUND

- The ICD guidelines apply to both men and women, however,
- gender differences currently exist in the rate of utilization of ICDs.
- Men are 3 times more likely to receive a device for primary prevention and more than twice for secondary prevention
- A recent  meta-analysis found no survival benefit for ICDs in women with heart failure and primary prevention indication

# AIM

- To compare
  - The indication for ICD implantation
  - The type of ICD implanted
  - The re-intervention rate
  - outcomes

In women vs. men

# METHODS

- The Israeli ICD registry is a prospective nationwide database of all ICD implants.
- All ICDs implants 7/2010-6/2012
- Web based CRF at implant / re-do procedure
- Follow up cohort centers interrogated
  - Median FU time ~ 12 months
  - Centers compliance rate ~ 50%

# RESULTS

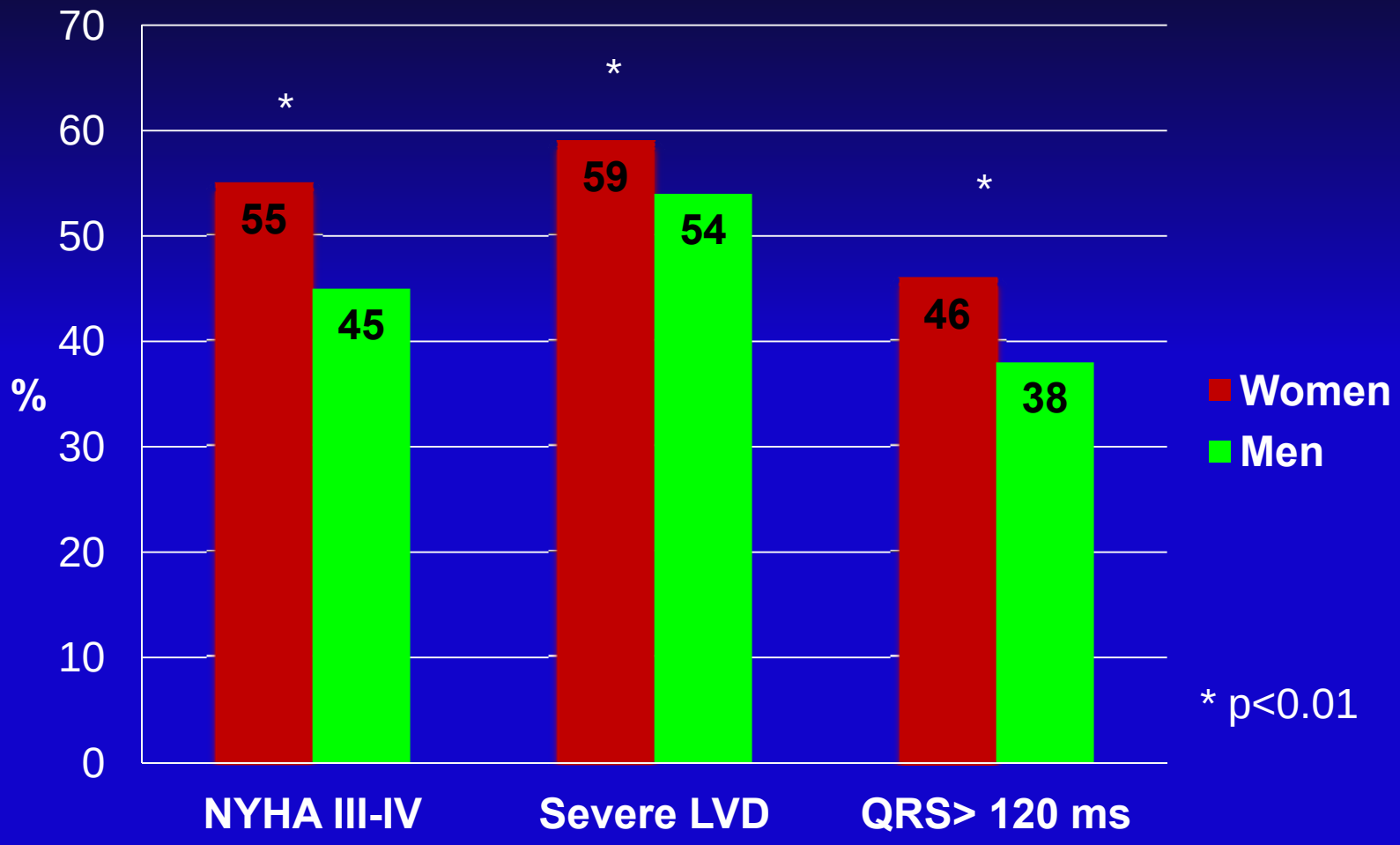
- Baseline cohort 2811 subjects (17% women)

| N (%) | Women N=485 | Men N=2326 | p-value |
|---|---|---|---|
| Age mean ± SD | 64 ± 13 | 65 ± 12 | 0.14 |
| Diabetes | 156 (32) | 871 (38) | 0.02 |
| Hypertension | 275 (57) | 1484 (64) | <0.01 |
| Dyslipidemia | 237 (49) | 1301 (56) | <0.01 |
| Smoking | 60 (13) | 819 (36) | <0.01 |

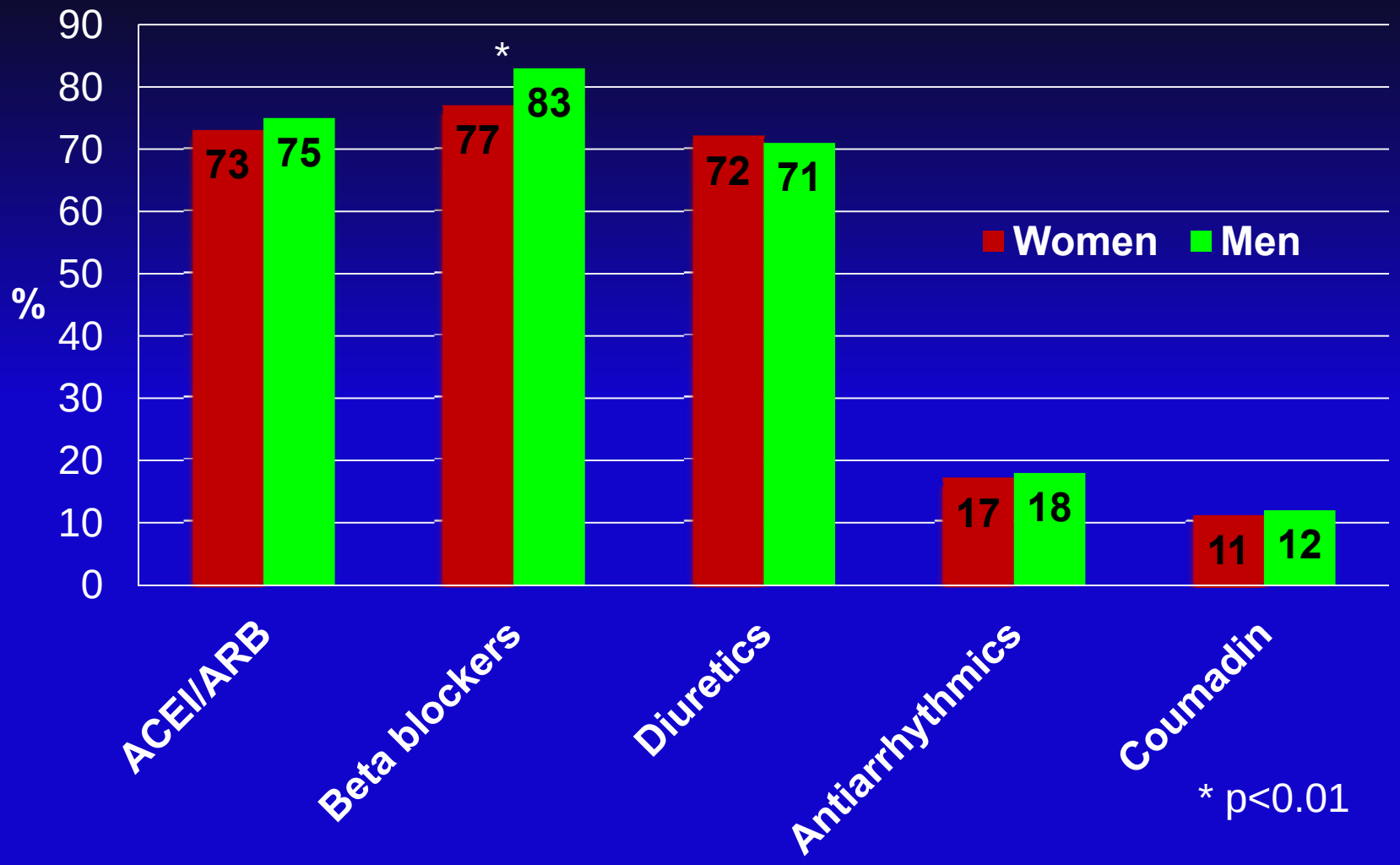
# RESULTS

| N (%) | Women<br>N=485 | Men<br>N=2326 | p-<br>value |
|---|---|---|---|
| Ischemic cardiomyopathy | 229 (47) | 1862 (80) | <0.01 |
| Severe LV dysfunction (LVEF<30%) | 271 (59) | 1253 (54) | <0.01 |
| Atrial fibrillation | 102 (21) | 493 (21) | 0.91 |
| Heart failure; NYHA class | | | <0.01 |
| I - II | 177 (45) | 1018 (55) | |
| III - IV | 217 (55) | 841 (45) | |

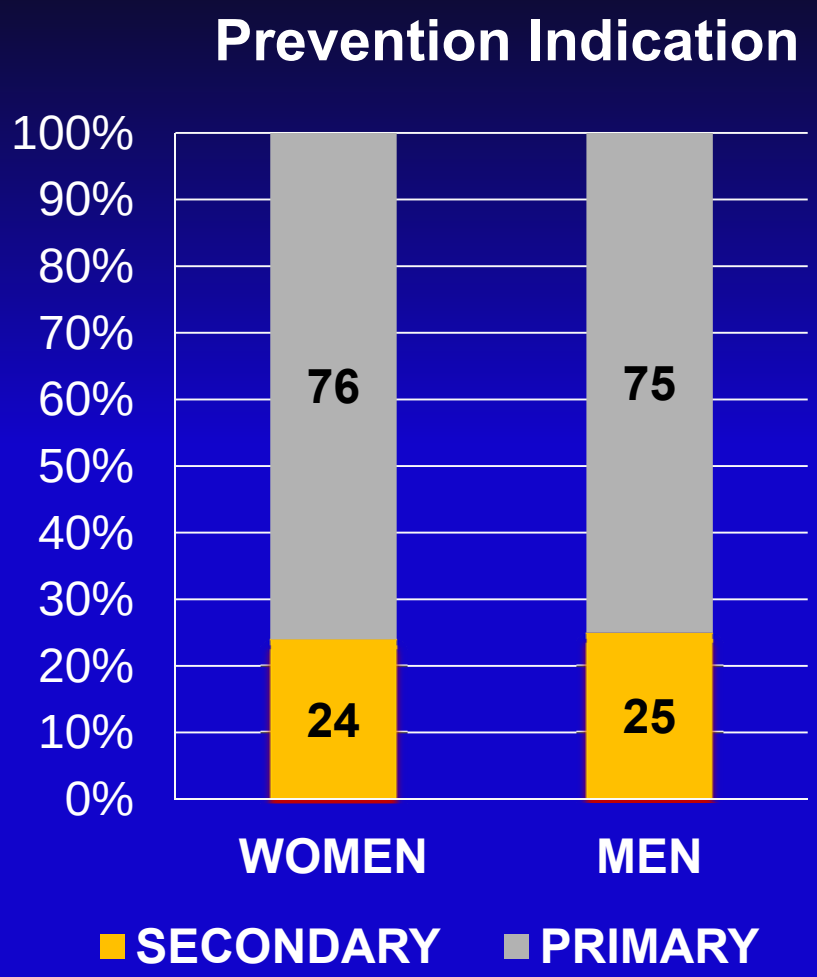
# RESULTS

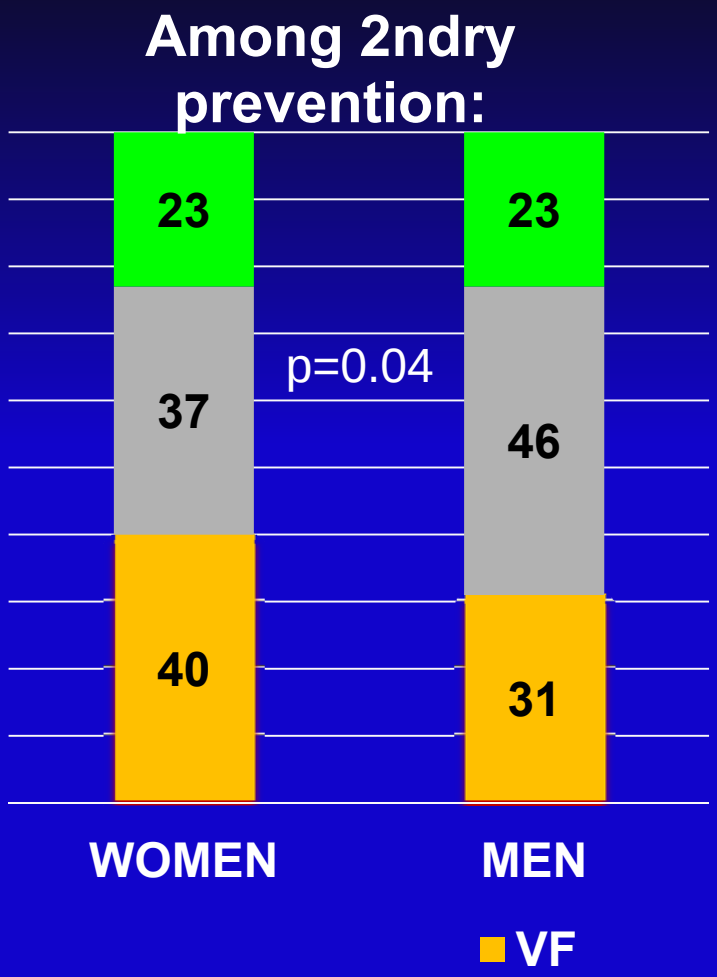

70
60
50
40
30
20
10
0
%
*
*
*
55
45
59
54
46
38
NYHA III-IV
Severe LVD
QRS> 120 ms
Women
Men
* p<0.01

# RESULTS

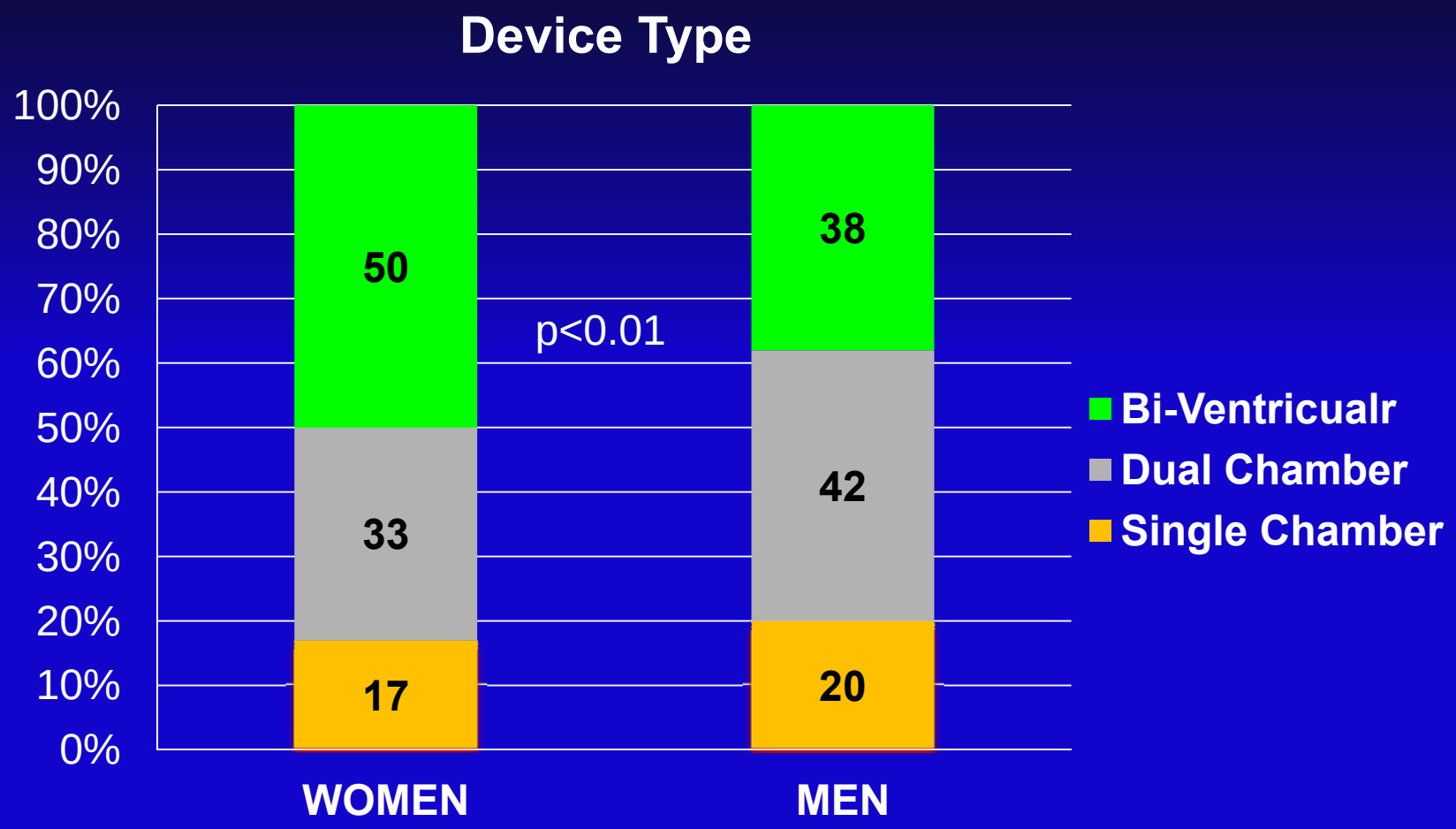

90
80
70
60
50
40
30
20
10
0
%
*
73
75
77
83
72
71
17
18
11
12
Women
Men
ACEI/ARB
Beta blockers
Diuretics
Antiarrhythmics
Coumadin
* p<0.01

# RESULTS


Prevention Indication
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
76
75
24
25
WOMEN
MEN
SECONDARY
PRIMARY


Among 2ndry prevention:
23
23
37
46
p=0.04
40
31
WOMEN
MEN
VF

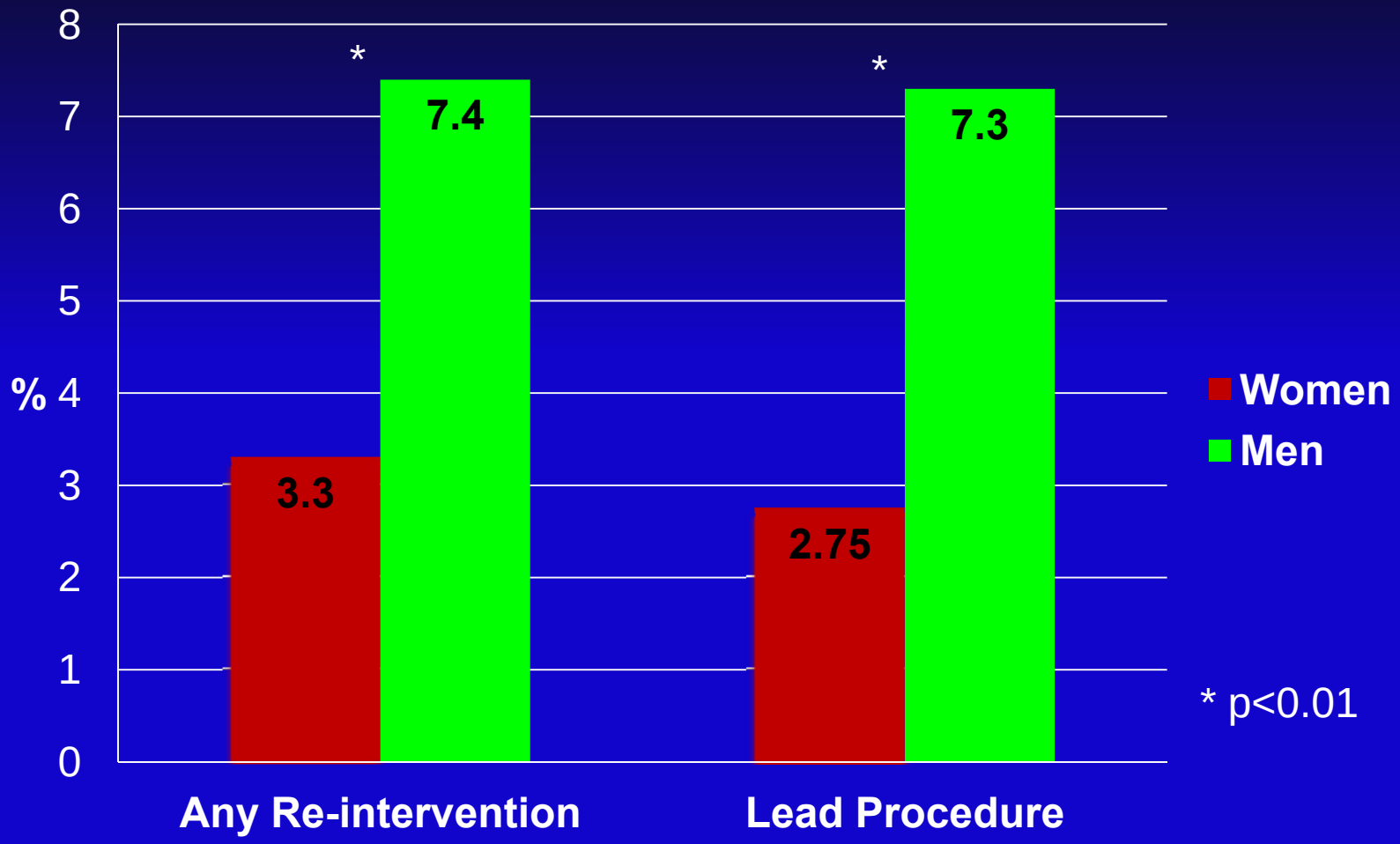
# RESULTS


Device Type
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
50
33
17
p<0.01
38
42
20
WOMEN
MEN
Bi-Ventricualr
Dual Chamber
Single Chamber

# Predictors of CRT (vs. ICD) Implantation (HR, 95%CI)

| | All patients |
|---|---|
| Gender women vs. men | 2.4 (1.5-4.0) |
| NYHA class 3 vs. 1-2 | 7.7 (6.2-9.7) |
| QRS duration> 120 ms | 10.8 (8.6-13.5) |
| Left ventricular ejection fraction< 30% vs. higher | 2.4 (1.8-3.1) |
| Secondary vs. primary prevention indication | 0.5 (0.4-0.7) |
| Age | 1.02 (1.01-1.03) |
| GFR ≤60 ml/min vs. higher | 1.3 (1.0-1.7) |

# Re-intervention Rates

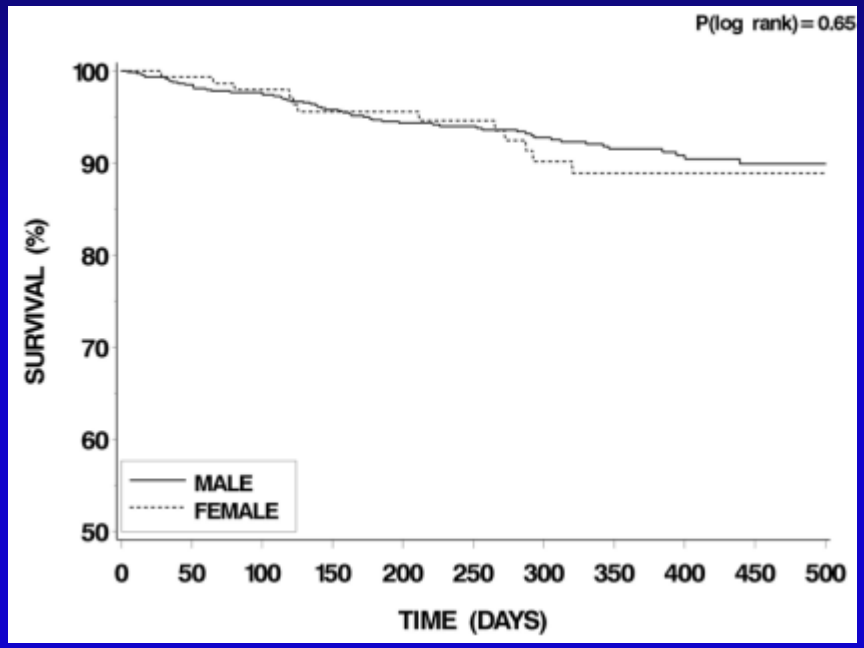


# The Impact of Gender on Events during Follow up

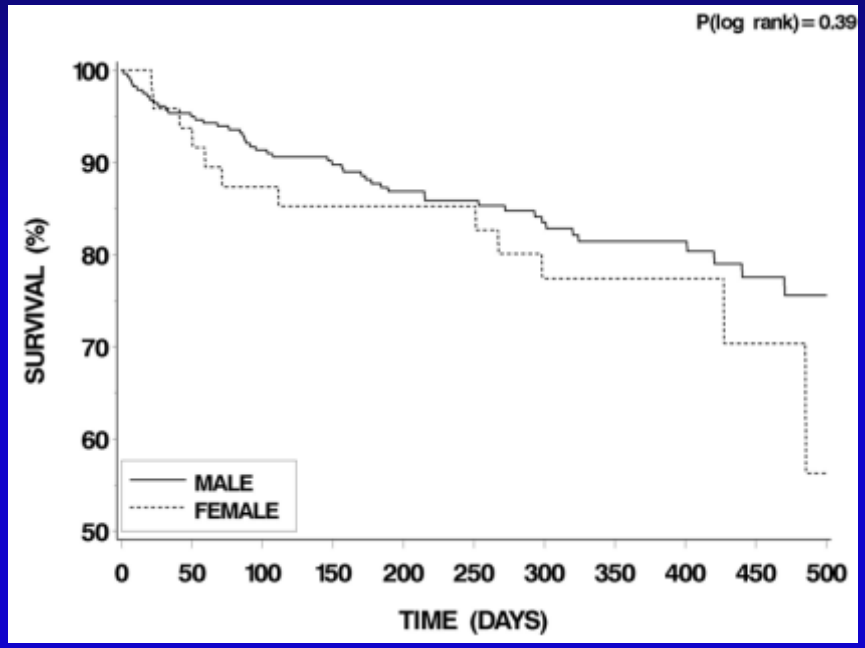
| | HR | 95% CI | p-value |
|---|---|---|---|
| Death | 0.98 | 0.40-2.41 | 0.96 |
| Appropriate therapy | 0.72 | 0.25 – 2.05 | 0.53 |
| Heart failure admission | 0.87 | 0.43-1.79 | 0.71 |
| Death or appropriate therapy | 0.87 | 0.44-1.72 | 0.69 |
| Death or heart failure admission | 0.92 | 62-1.530. | 0.78 |

# Time to Appropriate Therapy/ Death

## Primary Prevention

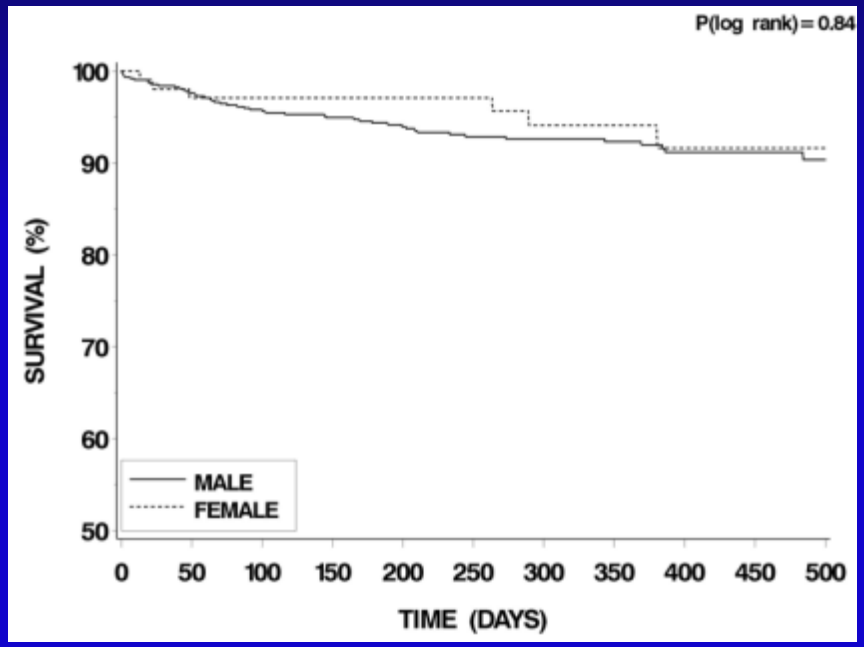



## Secondary Prevention

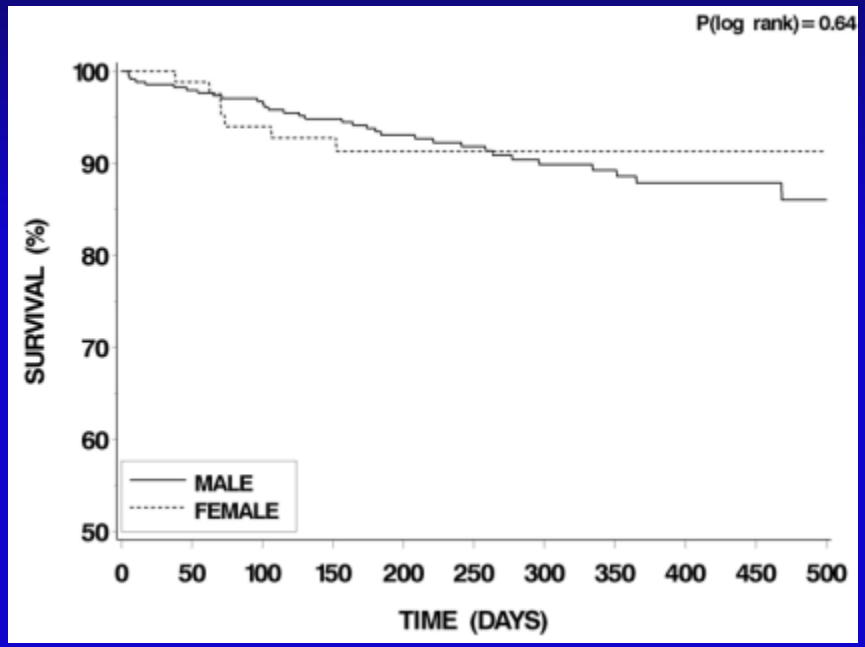


# Time to HF admission / Death

## ICD




## CRTD



# Conclusions

- Significant sex differences were found: women have
  - A higher proportion of non-ischemic cardiomyopathy.
  - A higher proportion of CRTS devices.
  - A higher rate of VF among the secondary prevention group.
- There are different factors associated with implantation of CRTD devices in men and women.

# Conclusions

- Women have a higher rate of re-intervention procedures
- During follow up, there were no significant differences in the rate of:
  - Appropriate therapy
  - Heart failure admissions
  - Death
  - A combination of the above