maximum heart rate. All measurements were repeated on a FFA infusion.

**Results:** Eleven participants were recruited (6 male, median age 63 [IQR 60-74]). Measures of cardiac systolic performance (cardiac work and dP/dtmax) were significantly improved by CRT at rest and stress on both infusions, without an increase in myocardial oxygen demand, resulting in improvement in cardiac efficiency (insulin/dextrose at rest: 7.9%, p = 0.02; stress: 67%, p = 0.03; FFA at rest: 31%, p = 0.02; stress: 57%, p = 0.09). On insulin/dextrose, CRT at rest increased FFA uptake (14 [4.9-41.6] vs 1.8 [-6-15.4] μmol/min, p = 0.02), which positively correlated with improvement in LVEF (R = 0.86, p = 0.02). When FFA uptake was already increased during stress, CRT increased lactate uptake (31% [19.3-57.5] vs 23.5 [-2.7-31.2] μmol/min, p = 0.02). When FFA uptake was maximised on a FFA infusion, CRT increased ketone uptake both at rest and during stress, which positively correlated with improvement in cardiac work (R = 0.55, p = 0.04).

**Conclusion:** CRT improves cardiac efficiency and reverses the metabolic phenotype of heart failure towards a more physiological picture of FFA uptake. The increase in FFA uptake correlates with improved systolic function. When FFA uptake is already maximised, CRT increases lactate or ketone uptake. Metabolic flexibility is therefore retained.

**PO-628-02**

**PERSONALIZED PACING (MYPACE): A NEW PARADIGM FOR PATIENTS WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION**

Margaret Infeld MD, MS; Kramer Wahlberg MD; Jillian Cicero BS; Nicole Habel MD, PhD; Sean Meagher MD; Alexandra Novelli BS; Anand Muthu Krishnan MD; Timothy Plante MD, MHS; Margaret Infeld MD; Jason L. Lustgarten MD, PhD, FHRS; Nicole Habel MD, PhD; Sean Meagher MD; Alexandra Novelli BS; Anand Muthu Krishnan MD; Timothy Plante MD, MHS; Daniel Silverman MD; Daniel L. Lustgarten MD, PhD, FHRS and Markus Meyer MD, PhD

**Background:** Pacemaker patients with preclinical or overt heart failure with preserved ejection fraction (HFpEF) may benefit from a backup heart rate (HR) that is higher than the standard 60 beats per minute (bpm) setting.

**Objective:** Assess the effects of a personalized backup HR (myPACE group, based on a HR algorithm) compared with 60bpm (control group).

**Methods:** In this double blind randomized controlled study, pacemaker patients with HFpEF and either atrial pacing alone or conduction system or biventricular pacing were assigned to the myPACE or control group for 1 year. The primary outcome was change in Minnesota Living with Heart Failure Questionnaire (MLHFQ) scores (range 0-125, lower is better). Secondary outcomes were changes in N-terminal brain natriuretic peptide (NTproBNP), pacemaker-detected activity levels, pacemaker-detected atrial fibrillation (AF) burden, and adverse clinical events (composite of death, stroke, AF, and HF events).

**Results:** The myPACE (n=50; mean ± standard deviation age 76±12 years; 47% female) and control groups (n=57; mean age 75 ± 9 years, 48% female) were similar at baseline. The mean HR in the myPACE group was 77 ± 5bpm. Compared with controls, MLHFQ scores improved in the myPACE group over 1 year as shown in the Table (p<0.001). Similarly, NTproBNP levels and patient activity levels improved in the myPACE group (both p<0.02). The myPACE group had 6 adverse events in 6 patients and the control group had 19 adverse events in 14 patients.

**Conclusion:** Among pacemaker patients with preclinical or overt HFpEF a moderately increased, personalized backup HR setting improves quality of life, NTproBNP, and activity levels compared with the standard 60bpm setting, without an excess of adverse effects.

**Table. Between-group differences in the myPACE study**

<table>
<thead>
<tr>
<th>Primary outcome</th>
<th>myPACE group</th>
<th>Control group</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLHFQ score</td>
<td>52.5±19.9</td>
<td>61.5±19.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>1 month score</td>
<td>49.0±18.6</td>
<td>56.5±18.3</td>
<td>0.002</td>
</tr>
<tr>
<td>1 year score</td>
<td>51.5±19.2</td>
<td>56.0±18.2</td>
<td>0.006</td>
</tr>
</tbody>
</table>

**PO-628-03**

**ASSOCIATION OF MINERALOCORTICOID RECEPTOR ANTAGONIST USE WITH MORTALITY AND VENTRICULAR ARRHYTHMIA RISK IN PATIENTS WITH IMPLANTABLE CARDIOVERTER-DEFIBRILLATORS**

Ramya Sampath; Anita Y. Chen MS; Scott McNitt MS; Alexander Diamond; Mehmet K. Aktas MBA, MD, FHRS; Valentina Kutyifa MD, PhD, FHRS; Hillel Steiner MD; Milica Bjelic MD; Wojciech Zareba MD, PhD; Ilan Goldenberg MD and Himabindu Vidula MD, MS

**Background:** Heart failure (HF) patients with implantable devices have improved outcomes on optimal Guideline-Directed Medical Therapy (GDMT), yet few studies have evaluated the impact of mineralocorticoid receptor antagonists (MRA) on mortality and arrythmia risk in patients who may be unable to tolerate optimal GDMT.

**Objective:** To assess the impact of MRA use on the risk of all-cause mortality and ventricular tachyarrhythmia (VTA) in HF patients with an ICD or CRT-D who were not concomitantly treated with both beta blockers (BB) and ACE-inhibitors/angiotensin receptor blockers (ACE/ARB) in 4 MADIT (Multicenter Automatic Defibrillator Implantation Trial; MADIT-II, MADIT-CRT, MADIT-RIT, MADIT-RISK) and Ranolazine in High-Risk Patients with ICD (RAID) clinical trials.

**Methods:** We included 5504 patients enrolled in 5 landmark ICD clinical trials. Patients were categorized by MRA use in addition to baseline BB and/or ACE/ARB use into subgroups of those who were prescribed both BB and ACE/ARB (2-drug GDMT) and those who were prescribed only one of the two drugs (1-drug GDMT) at enrollment. Cox proportional hazards regression models and Fine and Gray regression models, stratified by studies, were performed to assess the association between time-dependent MRA use and risks of all-cause mortality and VTA. VTA was defined as any treated or monitored sustained ventricular tachycardia (>170 bpm) or ventricular fibrillation.

**Results:** Among 5504 study patients, 4392 (80%) were prescribed 2-drug GDMT and 1016 (18%) were prescribed 1-drug GDMT. MRA was prescribed to 1656 (30%) patients. Multivariate analysis demonstrated that MRA use was associated with a 52% reduction in mortality risk when prescribed in patients on 1-drug GDMT (HR=0.48 [95% CI: 0.27-0.86], p=0.014). The mortality benefit of MRA therapy was attenuated among patients on 2-drug GDMT (HR=1.05 [95% CI: 0.82-1.34], p=0.7) (Figure 1). Further, MRA use was associated with a 36% reduction in VTA risk in patients on 1-drug GDMT (HR=0.64 [95% CI: 0.40-1.01], p=0.05), while among patients on 2-drug GDMT the association of MRA use with VTA risk was also attenuated (HR=1.09 [95% CI: 0.93-1.29], p=0.28) (Figure 2).

**Conclusion:** In HF patients with an ICD or CRT-D who are unable to tolerate 2-drug GDMT, MRA use is associated with a reduction in the risk of mortality and VTA.
THE EFFECT OF METOPROLOL VERSUS CARVEDILOL ON THE RISK OF ATRIAL AND VENTRICULAR ARRHYTHMIA IN PRIMARY PREVENTION IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR RECIPIENTS

Alexander Diamond; Ilan Goldenberg MD; Arwa Younis MD; Ido Goldenberg MD; Ramya Sampath; Valentina Kutyifa MD, PhD, FHRS; Anita Chen; Scott McNitt; Bronislava Polonsky; Jonathan S. Steinberg MD, FHRS; Wojciech Zareba MD, PhD and Mehmet K. Aktas MBA, MD, FHRS

Background: Both selective and non-selective beta-blockers (BB) are used to treat patients with heart failure (HF). However, data on the association of BB type with risk of atrial and ventricular arrhythmia (VA) in HF patients with a primary prevention implantable cardioverter-defibrillator (ICD) are limited.

Objective: To evaluate the effect of metoprolol vs. carvedilol on the risk of atrial and ventricular arrhythmia in HF patients with an ICD.

Methods: The study analysis included 4,354 primary prevention ICD recipients who were enrolled in five landmark ICD trials (MADIT-II, MADIT-CRT, MADIT-RIT, MADIT-RISK, and RAID). A Fine and Gray regression model, stratified by studies, was used to evaluate the risk of fast VA, defined as ventricular tachycardia ≥200 bpm or ventricular fibrillation, and the risk of atrial fibrillation (AF) or supraventricular tachycardia (SVT) by BB type, adjusting for risk factors.

Results: Among 4,354 study patients 2,967 (54%) were prescribed carvedilol and 1,387 (46%) metoprolol. The cumulative incidence of fast VA at 3.5 years was 15% in patients on carvedilol vs. 20% in patients on metoprolol, p<0.01 (Figure A). Multivariate analysis showed that patients on carvedilol had a 18% lower risk of fast VA (HR [95% CI] = 0.82 [0.69-0.98]; p=0.031) when compared to those on metoprolol. Similarly, the cumulative incidence of AF or SVT at 3.5 years was 12% in patients on carvedilol vs 15% in patients taking metoprolol, p=0.003 (Figure B). Multivariate analysis showed that carvedilol treatment was associated with a 35% reduction in the risk of AF or SVT (HR [95% CI] = 0.65 [0.53-0.80]; p<0.001) when compared to metoprolol.

Conclusion: Our findings suggests that HF patients with ICDs on carvedilol experience a lower risk of fast VA, AF or SVT when compared to those on metoprolol.

THE EFFECT OF ALDOSTERONE ANTAGONISTS ON MORTALITY IN PATIENTS WITH HEART FAILURE WITH PRESERVED EJECTION FRACTION AND ATRIAL FIBRILLATION

Harold Rivner MD; Raul D. Mitrani MD, FHRS, CCDS; Alex Velasquez MD; Litsa K. Lambrakos MD; Jeffrey J. Goldberger MBA, MD and George R. Marzouka MD

Background: While aldosterone antagonists (AA) have not been shown to improve mortality in heart failure with preserved ejection fraction (HFpEF), their effect on left atrial myopathy could provide benefit in the subgroup of HFpEF patients with atrial fibrillation (AF).

Objective: To determine in the national Veterans Administration (VA) database if there is an effect of AA on mortality in HFpEF patients with AF.

Methods: We identified AF patients with ejection fraction ≥ 40% who were admitted with HF between 2002-2015. Baseline characteristics were determined by ICD-9/10 codes. Ejection fractions were collected from echocardiogram reports and database records. Records were reviewed for 5 years after the index hospitalization. Propensity score matching was used to create balanced groups.

Results: A total of 3,797 patient admitted with HF and had AF at baseline or during follow up were identified - 1,233 (age 69.2 ±