

occurred in the IMI group but not in the AMI group. Improvements in LVEF and MR were similar in both groups. **CONCLUSION:** Infarct location determines the extent of reverse LV remodeling in HF pts treated with CRT independent of baseline LV volume and function.

	AMI	IMI
	<b>Baseline Mean <math>\pm</math> Std</b>	<b>6mo. Median Paired Difference, (95% C.I.)</b>
LVEDV, cm <sup>3</sup>	297.6 $\pm$ 97.4 (n=48)	1.6 (-23.4, 20.7)
LVESV, cm <sup>3</sup>	229.6 $\pm$ 89.5 (n=48)	-5.4 (-18.6, 3.7)
LV EF, %	24.1 $\pm$ 6.2 (n=48)	2.3 (0.8, 3.9)†
MR Jet Area, cm <sup>2</sup>	9.35 $\pm$ 4.88 (n=36)	-4.2 (-5.8, -2.6)†

\* p<0.05 AMI vs IMI

† p<0.05 within group changes, baseline to 6-months

8:45 a.m.

### 872-2

#### Upgrade From Standard Right Sided Pacing to Cardiac Resynchronization Therapy Shows Clinical Benefit as in De Novo Implantation

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**Background:** Cardiac resynchronization therapy (CRT) produces clinical benefit in heart failure (HF) patients (pts) with intraventricular conduction delay. Previous studies excluded pts who already had a pacing device. In this study, pts with denovo (DN) CRT were compared to those undergoing upgrade (UP) to CRT from standard pacing.

**Methods:** Data from the Rush Heart Failure Database was collected including demographics, cause of HF, NYHA class, echo data (left ventricular ejection fraction LVEF, LV end diastolic dimension EDD, mitral regurgitation MR, tricuspid regurgitation TR), ECG intervals, drugs, hospitalizations (hosp), length of stay (LOS), procedure complications and mortality. Statistics were performed using t test, Fisher's exact test, Wilcoxon test.

**Results:** Twenty eight pts had DN implant (19 male, 13 ischemic, LVEF 20%, LVEDD 72mm), 21 pts had UP (15 male, 13 ischemic, LVEF 24%, LVEDD 73mm). Age was 61 $\pm$ 9 yrs in DN versus (vs) 67 $\pm$ 10 in UP (p<0.01). PR interval was 188 $\pm$ 34ms in DN vs 156 $\pm$ 57ms in UP. QRS duration was 152 $\pm$ 21ms in DN vs 181 $\pm$ 35ms in UP (p<0.01). In the DN, LVEDD decreased by 4 $\pm$ 2mm after CRT (p=0.04). In the UP, MR was less after CRT (p=0.02). Both groups had improved NYHA class immediately after CRT (p=0.02). In DN group this was still seen at 6 and 12 months (P<0.01). No difference was seen in the number of hosp in the groups 6 months before and after CRT. There was a trend to shorter LOS in the in the DN pts after CRT, -5 $\pm$ 2.5days (p=0.07). Dose of metoprolol succinate was 62 $\pm$ 17mg at baseline in DN pts but increased by 53 $\pm$ 19mg after CRT (p=0.01). Carvedilol dose was unchanged. No difference in beta blocker dose after CRT was seen in the UP pts. There were no differences in CRT related complications. There were 3 deaths in UP, 4 in DN group.

**Conclusion:** HF pts with standard pacing benefit from upgrade to CRT with improved NYHA class and decreased MR, without increased procedure related complications. CRT allows for uptitration of beta blockers in DN implants.

9:00 a.m.

### 872-3

#### Reverse Remodeling After Cardiac Resynchronization Therapy and Analysis of Effect in Heart Failure Patients With or Without an Indication for Implantable Cardioverter Defibrillator

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Evidence of reverse remodeling with CRT in moderate to severe heart failure (HF) patients (pts) with ventricular dysynchrony has been reported in several trials. An analysis was done to compare the results of a CRT versus a CRT+ICD trial. **METHODS:** We compared the magnitude of remodeling of two separate CRT trials differentiated by pts with and without an indication for an ICD. The MIRACLE and MIRACLE ICD trials enrolled HF pts (NYHA III/IV, QRS>130ms, LVEDD >55mm and EF<35%) and implanted them with an InSync (atrial synchronous biventricular pacer) or an InSync ICD system, respectively. In all pts AV delay was echocardiographically optimized by maximizing left transmitral filling without truncating the A wave. Patients were randomized to no pacing (control) or to treatment (CRT or CRT+ICD). Peak VO<sub>2</sub> consumption (pVO<sub>2</sub>), 6-minute half walk distance (6'HW) and Quality of life (QoL) were compared. Doppler echocardiograms were recorded in pts at baseline and 6 months, and analyzed by a core laboratory. LV end diastolic volume (LVEDV), LV end systolic volume (LVESV), LV ejection fraction (LVEF), Deceleration time (DT), and mitral regurgitation color flow jet area (MR) were obtained. Only treatment patients with paired baseline and 6 mos data were used. **RESULTS:** See table. **CONCLUSIONS:** The magnitude of clinical improvements and

reverse remodeling quantified using echocardiographic indices was similarly evident in both trials regardless of indication or placement of an ICD. \*p<0.05 between baseline and 6 months.

mean $\pm$ std	MIRACLE (n=196)	MIRACLE ICD (n=165)
	<b>Baseline</b>	<b>6 mo</b>
LVEDV (ml)	302 $\pm$ 107	266 $\pm$ 109*
LVESV (ml)	233 $\pm$ 98	195 $\pm$ 99*
LVEF (%)	24.2 $\pm$ 6.8	29.2 $\pm$ 9.0*
MR (cm <sup>2</sup> )	7.4 $\pm$ 5.9	4.3 $\pm$ 4.4*
DT (ms)	199 $\pm$ 84	236 $\pm$ 108*
pVO <sub>2</sub>	14.3 $\pm$ 3.5	15.4 $\pm$ 4.1*
6' HW (m)	310 $\pm$ 83	335 $\pm$ 125*
QOL	59 $\pm$ 20	39 $\pm$ 24*

9:15 a.m.

### 872-4

#### Benefit of Biventricular Pacing in Subsets of Patients With Heart Failure

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**Background**

Extending the current indications for cardiac resynchronization therapy (CRT) to patients with NYHA Class II symptoms, RV pacing or QRS  $\leq$  150ms has been proposed however no data has yet been reported to support this recommendation.

**Methods**

One-hundred and forty-four consecutive heart failure patients underwent CRT from January 1999 to January 2002. Clinical parameters of NYHA Class, QRS duration, LVEF, LV end-systolic (LVESD) and end-diastolic (LVEDD) dimensions were monitored at baseline and end of follow-up with a mean of 330  $\pm$  220 days.

**Results**

At baseline, 20 patients, 88 patients and 36 patients were in NYHA Class II, Class III and Class IV respectively, 34 patients with right ventricle pacing, and 29 patients with a QRS duration  $\leq$  150ms. After CRT, the patients who were in NYHA Class II had significant improvement in LVEF and LV dimensions. Patients with RV pacing had significant improvement in NYHA Class, QRS duration, LVEF and LV dimensions. The patients with QRS duration  $\leq$  150ms had significant improvement in NYHA class and a significant increase in the QRS duration. (Table I)

**Conclusion**

Non-conventional candidates for CRT may derive significant structural and functional benefit with CRT and should be analyzed in future clinical trials.

Patient Subgroups	NYHA Class II	NYHA Class III/IV	RV Pacing	QRS duration $\leq$ 150ms
Clinical Variables	Pre-CRT	Post-CRT	Pre-CRT	Post-CRT
NYHA Class	2	1.75	3.1*	2.5*
QRS Duration (ms)	171	159	174*	164*
LVEF (%)	17.9*	27.6*	18.9*	23*
LVEDD (cm)	6.6*	6.1*	6.8*	6.5*
LVESD (cm)	5.5*	4.8*	5.7*	5.3*

\* denotes difference is significant, p<0.05

9:30 a.m.

### 872-5

#### Incidence of Diastolic Dyssynchrony in Dilated Cardiomyopathy and Effects of Biventricular Pacing

Christophe Jago, Iris Schuster, Christine Medail, Jean Lefevre, Frederic Franceschi, Jean-Marie Vailloud, Ange Ferracci, Jean-Claude DeHaro, Pierre Djiane, Gilbert H. Habib, La Timone Hospital, Marseille, France

**Background.** Resynchronization is an accepted treatment of dilated cardiomyopathy (DCM). Its benefit has been related to the correction of *systolic* (S) dyssynchrony (DYS) either interventricular (Inter) or intraventricular (Intra). However, little is known about *diastolic* (D) DYS and the effects of biV pacing on it

**Objectives:**

1 - to compare the respective occurrence of D and S DYS in pts with DCM and LBBS.

2 - to assess changes in both D and S delays under Biv pacing

**Methods.** 37 pts with DCM and wide QRS were studied by Tissue Doppler Imaging (TDI) before and immediately after biV pacing. S and D parameters were measured using delays between onset of QRS and onset of the TDI velocity curves. The septal and lateral walls of the left ventricle were used to assess Intra DYS. Similar measurements between lateral free walls of right and left ventricles were used to assess Inter DYS.