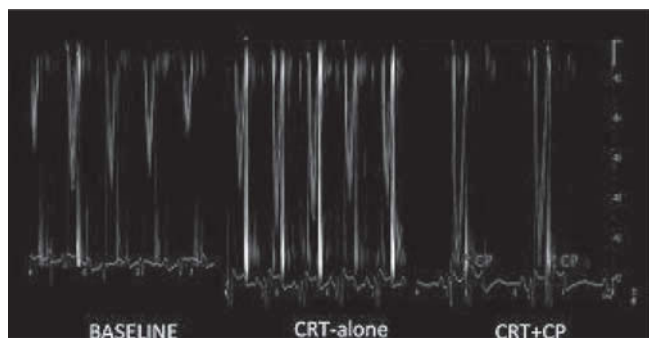


cardiac resynchronization therapy (CRT) to improve the efficiency of CRT in heart failure patients.

**Methods:** The study included 21 heart failure patients referred for CRT-D implantation (LVEF=27±5.4%, QRS=149±33ms, NYHA=III-IV, 64±10 years). Coupled pacing was delivered in association to CRT (CRT+CP) from the right and the left ventricular leads. The CP beat was delivered 330±42 ms after R wave during the refractory period. Echocardiography data were collected at baseline, during CRT and CRT+CP to assess changes in left ventricular ejection fraction (LVEF), cardiac output (CO), longitudinal global strain by speckle tracking and +dP/dt.

**Results:** Heart rate markedly decreased during CRT+CP (50±9 bpm vs. 78±20 bpm during CRT alone  $p<0.0001$ ) and was associated to a greater increase in LVEF compared to CRT alone (+8%  $p<0.0008$  vs. +3.5%,  $p=0.01$ ). Similarly, +dP/dt was greater during CRT+CP than CRT alone (944±503 mmHg.ms<sup>-1</sup> vs. 617±217mmHg.ms<sup>-1</sup>,  $p=0.02$ ). In addition, peak longitudinal global strain increased only during CRT+CP (-8±2% vs. -6±2% at baseline and during CRT,  $p<0.001$ ). Importantly, despite a decrease in heart rate during CP, cardiac output and systolic blood pressure remained unchanged.

**Conclusion:** Coupled pacing in addition to CRT decreases heart rate and contributes to a greater increase in LVEF, +dP/dt, and peak global strain without decreasing cardiac output.



Impact on LV outflow track

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### Acute consequences of cardiac contractility modulation in an animal model of chronic right ventricular failure

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**Introduction:** Cardiac Contractility Modulation (CCM) delivers non excitatory electrical signals to the heart during the absolute refractory period intended to improve contraction. It's assessment has been previously published on left ventricular failure by experimental and clinical studies. CCM has never been studied yet on right ventricular failure.

**Methods:** We used an animal model of right ventricular barometric and volumetric overload mimicking repaired Tetralogy of Fallot, as previously described. Seven sheeps were operated within the first 2 months of life (W=6±2 kg), they were seen back twelve months later and implanted with CCM device. We performed hemodynamic and echocardiographic study, and mitochondrial function analysis on right ventricular biopsies, with CCM off and on.

**Results:** The hemodynamic data showed a significant improvement of RV dP/dt max (725±/-260 mmHg/s vs 780±/-275 mmHg/s) and LV dP/dt max (1800±/-600 mmHg/s vs 1973±/-635 mmHg/s) with CCM on. We also found significant improvement of mitochondrial global respiration measured by the Acceptor Control Ratio (3.74±/-0.81 vs 5.52±/-1.68).

**Conclusion:** Cardiac Contractility Modulation, in an animal model of RV dysfunction, showed significant improvement in acute hemodynamics and mitochondrial function. The clinical implementation of this technique seems promising.

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### Age-related findings of electrophysiological study in patients with heart disease and syncope

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Electrophysiological study (EPS) is recommended in patients (pts) with syncope, heart disease (HD), left ventricular ejection fraction (LVEF) >30%. Implantable defibrillator (ICD) is recommended when LVEF is <30%, but is discussed in old pts. The purpose of the study was to look for the influence of age on the results of EPS in pts with HD.

**Methods:** 504 pts with HD (ischemic 386 or other origin 118) were admitted for syncope. 303 were aged less than 70 years (group (gr) I), 155 from 70 to 79 years (gr II), 46 more than 79 years (gr III). Evaluation of LVEF, Holter ECG, head-up tilt test were systematic. EPS included the evaluation of AV and sinoatrial conduction, a programmed atrial and ventricular stimulation.

**Results:** Male gender was more frequent in gr I than in gr II (88% vs 79%,  $p<0.01$ ) and III (63%,  $p<0.0000$ ). LVEF was lower in group I than in gr's II and III (38±14 vs 42±13,  $p<0.006$ , 44.5±13,  $p<0.004$ ). EPS remained negative with the same incidence in gr I (20%), II (22%) and III (24%). Monomorphic sustained ventricular tachycardia (VT) <270 bpm was induced as frequently in gr I (22%), II (27%), III (27%). Ventricular flutter or fibrillation were induced more frequently in gr I (22%) than in gr II (14%) and III (9%) ( $p<0.05$ ). The frequency of supraventricular tachycardia was similar in gr I (16%), II (10.5%) and III (7%). AV conduction abnormality was less frequent in gr I (6%) than in gr II (12.5%) ( $p<0.001$ ) and III (14%) ( $p<0.009$ ). At other investigations, ischemic-related syncope was less frequent in gr I (9%) than in gr II (22%) ( $p<0.008$ ) and III (13%) (NS) and hypervagotonia more frequent in gr I (10%) than in gr II (5%) ( $p<0.05$ ) and III (4%) (NS).

**Conclusions:** Complete evaluation, including EPS is useful in elderly people presenting with syncope and HD. VT Induction is as frequent as in adults leading to discuss ICD implantation. AV conduction abnormalities are frequent and a simple pacemaker implantation is enough.

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### Have women the same causes and the same prognosis as men in case of syncope associated with underlying heart disease?

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Gender differs in some heart diseases (HD). The purpose of the study was to look for the influence of gender on the results of electrophysiological study (EPS) in patients with heart disease (HD).

**Methods:** 504 patients, 85 women, 419 men were admitted for syncope. They had an HD, either ischemic HD (n=386) or left ventricular impairment of other origin (n=118). Echocardiography, Holter monitoring and head-up tilt test were systematic. EPS was complete including the evaluation of AV conduction and sinoatrial conduction, programmed atrial and ventricular stimulation (PVS).

**Results:** Women had the same age (66±15 years) and the same LVEF (41±15%) as the men (64±11 years, 40±14%). Ischemic HD was less frequent in women (67%) than in men (78%) ( $p<0.03$ ). Monomorphic sustained ventricular tachycardia (VT) <270 bpm was induced less frequently in women