tial building was derived; b) the total residential volume for each of the 88 Milan neighborhoods was computed; c) from the citizen registry, the population density for each neighborhood was obtained; d) the estimated residents/building were computed based on its position.

**Results:** During 2015–16, 3927 OHCA were recorded in Milan (average population 1360000, average incidence 1.44‰),of which 3480 (88.6%) at home and 847 outside (11.4%). The number and position of AED (518) available at 31/12/2015 was considered. Only 12.77% of the territory was covered by AED, including 3.3% overlapped by different catchment areas, resulting in 22.41% of total population covered (5.7% in overlapped areas). Based on the location of the call to 112 emergency number, 876 OHCA (22.31% of the total) were inside at least one catchment area (6.65% at least in two), and thus could have potentially benefited by AED. However, only in 32/876 (3.65%) cases, an AED was effectively used by layman rescuers.

**Conclusions:** The use of HG tools for representing both the position of OHCA and AED is a novel and valuable opportunity to derive information to guide spatial optimization planning for public health. The distribution of AEDs in Milan resulted not homogeneous, with areas with no coverage and areas with overlapped coverage. Even when in the vicinity of an AED, only a minimal part of OHCA benefited from its utilization, probably due to the high % of OHCA events at home. New decision-making strategies to assist in AED repositioning are needed, as well as new ways to inform citizens about their position and recruit them in case of emergency.

# CARDIOVASCULAR REHABILITATION

## P2549
### Efficacy and safety of ballroom dancing, as a physical training modality for elderly with cardiovascular disease

M. Garcia-Saldivia, H. Ilarraza-Lomeli, M.D. Rius-Suarez, J. Rojano-Castillo, M. Franco-Ojeda, C.R. Chavez-Dominguez, J. Espinoza, N. Garcia-Hernandez, A. Avila-Estrada, K.M. Castolo-Sanchez. *National Institute of Cardiology Ignacio Chavez, Cardiac Rehabilitation, Mexico City, Mexico*

**Introduction:** Among elderly, cardiac rehabilitation programs (CRP) are widely recommended, nevertheless, physical activity is often boring, due to lack of several training modalities. Dancing therapy is an attractive way to exercise, and some research groups have demonstrated its usefulness in young patients with heart disease.

**Purpose:** Evaluate efficacy and safety of ballroom dancing (BRD) among elderly with heart disease.

**Methods:** A cohort of patients older than 65 years and who participated in a CRP, was studied. Risk stratification was performed, including a cardiopulmonary exercise testing (CPX). BRD consisted in 20 minutes sessions of moderate intensity dancing routines, twice a week. Choreography steps were adapted to every group, where stronger patients performed more demanding dancing figures than weaker patients. Bivariate analyses were performed. Variables that demonstrated to be statistically significant were included in a logistic regression model. All p values less than 0.05 were considered significant.

**Results:** A total of 98 patients, aged between 65 and 88 years were included, 79% percent of them were male. Main diagnosis was ischemic heart disease (n=87). CPX variables are displayed on table 1. No major complications such as sudden death, malignant ventricular arrhythmia or acute myocardial infarction, were observed. Isolated ventricular complexes occurred during BRD in only 6% of patients. 75% of patient improved their exercise maximal tolerance. Bivariate analysis shown that stress, heart failure and history of complicated myocardial infarction, discriminated those patients who increased their fitness from those who did not. After a post-hoc analysis, only the history of complicated myocardial infarction, remained as an independent variable for predicting fitness improvement (RR 12.4, CI95% 1.1 - 138, p=0.04).

Cardiopulmonary exercise testing results

| Variable | Before | After | p |
|---|---|---|---|
| Peak VO$_2$ (ml/kg/min) | 15.1±4.3 | 17.8±4.4 | <0.0001 |
| Peak heart rate (bpm) | 116±20 | 124±20 | <0.001 |
| Peak SBP (mmHg) | 135±21 | 145±19 | <0.01 |
| VE/VCO2 slope | 35.9±7 | 35.1±7 | ns |
| RVO2 (seg) | 291±100 | 266±121 | ns |
| HRR (bpm) | 11.4±9 | 14±14 | ns |
| RER | 1.13±0.18 | 1.17±0.12 | ns |

SBP indicates systolic blood pressure; HRR, heart rate recovery; RVO2, recovery of oxygen uptake; RER respiratory exchange ratio.

**Conclusion:** BRD is an effective and safe manner to train eldelry patients with heart disease.

## P2550
### Improvement of endothelial function parameters during cardiac rehabilitation predicts recurrent chest pain in stable coronary artery disease patients-5 years follow up

D. Simonovic[1], M. Deljanin Ilic[2], S. Ilic[3], G. Kocic[4], R. Pavlovic[4]. *[1]Institut Niska Banja, Nis, [2]Institute of Cardiology, Medical Faculty University of Nis, Niska Banja, Nis, [3]Internal Medicine Specialist Practice, "Cardiopiont", Nis, [4]Institute of Biochemistry, Medical Faculty University of Nis, Nis, Serbia*

**Purpose:** To evaluate the effects of cardiac rehabilitation on circulating blood markers of endothelial function: nitric oxide (NOx), Xanthine Oxidase (XO) and asymmetricdimethylarginine (ADMA), and their prognostic significance on recurrent chest pain.

**Methods:** 65 patients (pts) (58.82±4.25 years, all men) were admitted to cardiac rehabilitation after myocardial infarction (MI). All patients underwent a supervised 3 weeks exercise training. At baseline and after 3 weeks in all pts values of NOx, XO and ADMA were determined. Clinical long-term follow-up (5 years) was performed. All medical therapy was documented, and for this analysis, we focused on recurrent anginal chest pain.

**Results:** After follow-up period there were no cardiovascular (CV) hard end points (CV death, MI, stroke), however 35 pts (54%) had episodes of typical anginal chest pain (AP group) while 30 pts (46%) were without anginal chest pain (no-AP group). During rehabilitation NOx increased in both groups: in no-AP group (from 33.42±7.51 to 48.12±10.05 μmol/L, p<0.0001) and in AP group (from 34.55±6.22 to 41.10±5.15 μmol/L, p<0.001) with significantly higher second measurement in no-AP group (p=0.001). The mean NOx increase in no-AP group was higher than in AP group (14.70±8.85 vs 6.55±5.72, p<0.0001). XO levels decreased in both groups, with higher mean XO decrease in no-AP group (119.40±12.90 vs 89.30±12.85 μmol/L, p<0.001). Also, ADMA levels decreased in both groups, with higher mean ADMA decrease in no-AP group (0.07±0.05 vs 0.04±0.06 μmol/L, p=0.03). A positive correlation was found between NOx increase and XO decrease in all pts (r=0.922, p<0.001); also between NOx increase and ADMA decrease in all pts (r=0.834, p<0.001). Univaried logistic regression analyses were performed and showed that NOx increase (OR 0.792, CI 0.610 - 0.982, p<0.001), XO decrease (OR 0.812, CI 0.641–0.971, p=0.005) and ADMA decrease (OR 0.905, CI 0.829–0.974, p=0.002) significantly predict a 5 years period without anginal chest pain.

**Conclusion:** Residential cardiovascular rehabilitation, in patients with stable coronary artery disease, improved endothelial function. Patients with higher increase of NOx, and greater reduction in XO and ADMA values after 3 weeks of specialized cardiac rehabilitation, during 5 years follow up, were without anginal chest pain and without any CV event.

## P2551
### Low serum brain-derived neurotropic factor may predict poor response to cardiac rehabilitation in patients with cardiovascular disease

Y. Tsukada[1], Y. Nishiyama[2], T. Nago[1], H. Matsuse[3], H. Harada[2], H. Niiyama[2], A. Katoh[2], H. Ikeda[4], K. Hisashi[2]. *[1]Kurume University Medical Center, Department of Rehabilitation, Kurume, Japan; [2]Kurume University Medical Center, Department of Cardiology, Kurume, Japan; [3]Kurume University Hospital, Department of Rehabilitation, Kurume, Japan; [4]Teikyo University, Department of Physical Therapy, Faculty of Fukuoka Medical Technology, Omuta, Japan*

**Background:** The association is suggested between serum brain-derived neurotropic factor (BDNF) and skeletal muscle energy metabolism. Recently, it has been shown that BDNF is a predictor of mortality in patients with heart failure. Little is known about the relationship between BDNF and cardiac rehabilitation (CR). The purpose of this study was therefore to investigate the effects of baseline serum BDNF levels on the CR-induced aerobic capacity improvement in patients with cardiovascular disease (CVD).

**Methods:** Ninety-nine CVD patients (mean age 71±12 years, male =60) were allocated to Low (L), Middle (M), and High (H) groups based on the tertiles of baseline BDNF levels. Cardiopulmonary exercise testing was performed twice before and after 3-weeks CR by supervised bicycle ergometer.

**Results:** At baseline, skeletal muscle mass index by bioelectrical impedance assay was significantly lower in L group than in H group (6.4±1.1 vs. 7.5±1.4 kg/m$^2$, p<0.005). The lower baseline BDNF levels, the better nutritional status evaluated by CONUT score (L: 2.8±1.6, M: 1.6±2.0, H: 1.2±1.3, p<0.005). Age, sex and handgrip did not differ among the three groups. The 3-weeks CR increased anaerobic threshold (AT) from 10.5±2.9 to 11.4±3.6 mL/kg/min (p<0.05) and peak oxygen uptake (peak VO2) from 14.5±4.3 to 15.7±4.5 mL/kg/min (p<0.05) in H group and increased AT from 10.4±2.2 to 11.4±2.6 mL/kg/min (p<0.001) in M group. In L group, CR did not change AT and peak VO2.

**Conclusions:** Low serum BDNF levels were associated with malnutrition and skeletal muscle mass reduction in CVD patients. In CVD patients with low baseline serum BDNF levels, aerobic capacity was not improved by CR. It is suggested that low serum BDNF levels would be a predictor of poor responders for CR to improve aerobic capacity in CVD patients, independently of age and sex.

## P2552
### Cardiac rehabilitation revisited: time to change standard practices?

S. De La Porte[1], M. Demeulenaere[1], B. Ectors[2], T. Stoop[2], N. Possemiers[2], T. Al Hatawe[2], K. Wuyts[2], P. Beckers[2], A. Vorlat[2], H. Heidbuchel[2], B. Shivalkar[2]. *[1]University of Antwerp, Cardiology, Antwerp, Belgium; [2]University of Antwerp Hospital (Edegem), Cardiology, Antwerp, Belgium*

**Background:** Traditionally Gated Blood Pool Scan (GBPS, using Technetium-