**F-21**

**Free Communication/Poster - Clinical Cardiorespiratory**

Friday, June 3, 2016, 1:00 PM - 6:00 PM  
**Room:** Exhibit Hall A/B

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**2963**  
**Board #28**  
June 3, 3:30 PM - 5:00 PM  
**Maintenance on Functional Capacity and Hemodynamic Responses after Discharge from Cardiac Rehabilitation**  
Felipe Araya-Ramirez1, Andres Trejos-Montoya1, Braulio Sanchez-Urena1, Luis Blanco-Romero1, Vera Rodriguez-Cambronero1, Peter W. Grandjean, FACSM2, National University of Costa Rica, Heredia, Costa Rica.  
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(No relationships reported)

Cardiac Rehabilitation (CR) improves functional capacity and hemodynamic responses to exercise. Clinicians need to know more about the extent to which CR improvements remain after discharge.

**PURPOSE:** To examine the maintenance of functional capacity and hemodynamic responses to exercise in cardiac patients 2 to 3 years after completing a Phase 2 CR program.

**METHODS:** We studied fifty-two patients from our University-based CR program between 2011 and 2014 (age = 59.1 ± 14 years, height = 1.67 ± 0.9 m, weight = 77.5 ± 13.2 kg, BMI = 27.6 ± 3.6 kg/m², VO2max = 15.7 ± 4.6 ml/kg/min). Patients returned 30.7 ± 9.0 months after CR discharge and performed a 6-minute walking Test (6MWT).

Functional capacity and VO2max were estimated based on the distance walked during the test and hemodynamic responses were also measured. A repeated measure ANOVA was used to compare variables at Pre (baseline), Post1 (at the end of CR) and Post2 (return visit after CR discharge). Significance was accepted at P < 0.05 level.

**RESULTS:** Functional capacity (distance walked during the 6MWT) improved 23.1% with CR (Pre to Post1: 443 ± 95 to 545 ± 87 m, P = 0.001) and was maintained at follow-up after discharge (Post1 to Post2: 545 ± 87 to 542 ± 71 m, P > 0.05). VO2max improved by 23.2% with CR (13.8 ± 5.0 to 17.0 ± 5.4 ml/kg/min, P = 0.001) but was decreased by 7.6% when measured at follow-up after discharge (17.0 ± 5.4 to 17.5 ± 4.6 ml/kg/min, P = 0.014). Body weight only increased 2.2% between CR discharge and follow-up (75.8 ± 12.2 to 77.5 ± 13.2 kg, P = 0.002). Resting heart rate decreased 7.0% between CR and follow-up (71 ± 9.0 to 66 ± 11 kg/m², P = 0.007). DBP was reduced by 5.6% with CR (71 ± 10 to 67 ± 9.0 mmHg, P = 0.002) and was maintained after discharge (67 ± 9.0 to 66 ± 9.0 mmHg, P > 0.05). With CR, patients experienced a greater five minute heart rate recovery after 6MWT (24 ± 13 vs 38 ± 16 bpm, P = 0.001), which was maintained at follow-up (38 ± 16 vs 39 ± 12 bpm, P > 0.05). Greater SBP recovery to the 6MWT with CR (20 ± 12 vs 29 ± 16 mmHg, P = 0.004) was also maintained at follow-up after discharge (29 ± 16 vs 27 ± 11 bpm, P > 0.05).

**CONCLUSION:** Our patients maintained CR improvements in functional capacity and hemodynamic responses to exercise months after discharge from our CR program. CR appears to provide health and fitness benefits that persist long after completing an intensive supervised rehabilitation program.

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**2964**  
**Board #29**  
June 3, 3:30 PM - 5:00 PM  
**Differences In Short-term Observation Post-hospitalization And Readmission Predictors In Cardiac Rehabilitation Participants And Non-participants**  
Ellen L. Glickman, FACSM1, Jacob E. Barkley1, Allan Shook2.  
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While prior studies have investigated hospital readmissions for subsequent cardiac events in patients with cardiovascular disease these studies have been limited to 30-day readmissions and have ignored short term observation (STO, hospitalizations < 48 hours).

**PURPOSE:** The purpose of this study was to assess predictors of STO and readmission at 60 and 180 days after initial hospitalization in cardiac patients who either did or did not participate in cardiac rehabilitation (CR).

**METHODS:** Of the 245 patients studied who were referred to Phase II CR following cardiac diagnosis only 45 patients elected to participate in CR. Patients 60 and 180-day readmission and STO rates were recorded. Several factors which had been previously identified as potential predictors of 30-day readmission rates were recorded. Stepwise regression analyses were then used to identify which of these variables were significant predictors of readmission and STO rates at 60 and 180 days.

**RESULTS:** Readmissions at 30, 60, and 180 days, age, number of atherosclerotic lesions treated at the time of hospitalization, history of depression, unemployed status, and no β-blocker prescription at discharge were significant predictors of readmission at 60 days. Length of stay after initial event, history of COPD, history of depression, prescribed antipiletlet medication at discharge, being uninsured, number of lesions treated, hypertensive status, and no prescription for angiotensin converting enzyme inhibitor (/angiotensin receptor blocker (ACE/ARB) at discharge were predictors of readmission at 180 days. Significant predictors for STO at 60 days were length of initial hospital stay, tobacco use, and absence of heart failure. Predictors for 180-day STO were cardiac arrest upon arrival, chest pain with admission, no ACE/ARB at discharge, severity of myocardial infarction, CR participation, tobacco use, and insurance status (ΔR² > 0.61, p < 0.01 for all).

**CONCLUSION:** Predictors of readmission and STO rates at 60 and 180 days could be grouped as: cardiac event severity (e.g., number of lesions, length of hospital stay), presence of comorbidities (e.g., COPD, depression), prescription medications (e.g., ACE/ARB, β-blocker), financial status (e.g., being unemployed, uninsured), and behavioral factors (e.g., tobacco use, CR participation).

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**2965**  
**Board #30**  
June 3, 3:30 PM - 5:00 PM  
**Gender Differences In Physical Activity Measured With Accelerometer 6 Weeks After Exercise-based Cardiac Rehabilitation**  
Inger-Lise Aamot, Elisabeth Vesterbekkmo, Håvard Dalen, Asbjørn Støylen. NTNU, Trondheim, Norway.

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(No relationships reported)

**PURPOSE:** To assess physical activity and sitting time in men and women with cardiovascular disease after completing 12 weeks of outpatient cardiac rehabilitation in two hospitals in Norway.

**METHODS:** 80 participants (13 women, mean age 64.2 (±5.8), body mass index 26.9 (±5.9) / 67 men, mean age 60.0 (±9.0), body mass index 26.1 (±3)), were recruited 6 (±4) weeks after cardiac rehabilitation cessation. Physical activity was measured with an accelerometer (Sensewear Armband, Bodymedia), worn at least three weekdays and a weekend for reliable measurements. The participants were instructed to wear the accelerometer for 24 hours per day, and were only removed during showering or bathing. Daily average of total energy expenditure (TEE), active energy expenditure (AEE), sitting time, time spent in light PA (1.5-3 METs), moderate PA (3-6 METs) and vigorous PA (6-9 METs) were obtained. Sitting time was calculated as sedentary time minus time lying down. Independent T-test was used for analysis.

**RESULTS:** The accelerometer was worn 6 (±1) days, 97 (±10) % of the time. Daily average TEE was 2945 (±496) Kcal and 2098 (±264) Kcal (p<0.001), and AEE 1455 (±546) kcal and 817 (±288) kcal (p<0.001), for men and women, respectively. Daily average time spent in light PA was 253 (±74) minutes and 240 (±110) minutes (p=0.677),
moderate PA 113 (±59) minutes and 65 (±29) minutes (p< 0.001), vigorous PA 15 (±18) minutes and 5(±6) minutes (p=0.076), for men and women, respectively. Daily average sitting time was 8.8 (±1.9) hours for men and 10.0 (±2.1) hours for women (p=0.051).

CONCLUSION: both men and women who had an exercise-based CR program met the recommended level of physical activity few weeks after cessation. Women were less physical active than men and spent more time sitting and should be encouraged to reduce sitting time.

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**2068**  
**Board #31**  
June 3, 3:30 PM - 5:00 PM  
**The Comparison Between Respiratory Muscle Strength, Functional Capacity And Sleep Quality In Adult Controlled Asthmatics And Health Controls**  
RENATA TRIMER, Katylene Lopes Zangrando, Paula Angelica Ricci, Humberto Lanzotti, Daniela K. Andaku, Ramona Cabiddu, Audrey Borghi-Silva. *Federal University of São Carlos, SAO CARLOS, Brazil.*  
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(No relationships reported)

Frequently asthmatic subjects report worsen the symptoms at night. Poor sleep quality is a particularly frequent complaint in patients with asthma and can reflect a negative impact on functional capacity

PURPOSE: The aim of our study was compare respiratory muscle strength, functional capacity and sleep quality in adult controlled asthmatics and healthy controls.

METHODS: 26 adult controlled asthmatics (29±9 years) and 12 healthy controls (27±8 years) were assessed for Pittsburg Sleep quality index (PSQI); Maximum inspiratory pressure (MIP) and estimated functional capacity using the Duke Activity Status Index (DASI).

RESULTS: The MIP was 106.5±31 in asthma group and 122±39 in control group. Asthmatics subjects had poor sleep quality with higher scores in PSQI (p<0.05) and lower estimated VO2 by DASI score (32(3) vs (p=0.05). MIP was negatively correlated with PSQI (r=-0.45) and positively correlated with estimated VO2 (r = -0.43) only in asthmatic subjects.

CONCLUSIONS: Asthmatic subjects present poor sleep quality and lower functional capacity when compared with matched controls. Lower respiratory muscle strength may reflect in poor sleep quality and reduced estimated functional capacity in asthmatics subjects.

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**2069**  
**Board #32**  
June 3, 3:30 PM - 5:00 PM  
**Changes in Ventricular Function After Vigorous Aerobic Exercise Training in Women with Pulmonary Arterial Hypertension**  
Joshua G. Woolstenhulme¹, Andrew A. Guccione², Jeffrey E. Herrick³, John P. Collins³, Leighton E. Chan³, Randall E. Keyser, FACSM². ¹The George Washington University, Washington, DC. ²George Mason University, Fairfax, VA. ³National Institutes of Health, Bethesda, MD.  
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(No relationships reported)

PURPOSE: To determine if 10 weeks of vigorous aerobic exercise training (AET) worsens left ventricular diastolic and systolic function in a group of women with pulmonary arterial hypertension (PAH).

METHODS: 18 women with PAH (age 56.2 ± 8.8 years, BMI 28.8 ± 7.3 kg/m²) underwent 10 weeks of vigorous AET at 70-80% heart rate reserve. Indices of cardiac function were measured during a graded exercise test (GXT) to peak exhaustion using bioelectrical impedance cardiography (ZCG) before and after the AET. A small subset (N=7) participated in a 10-week waiting period prior to beginning the AET and performed an additional GXT with ZCG before that period. A cohort of sedentary women serving as healthy controls (N=19) also performed a GXT with ZCG and were used for comparison.

RESULTS: Left ventricular ejection fraction (EF; 48 ± 9.2 vs. 61.5 ± 13.3 %, p=0.034) and the systemic vascular resistance index (SVRI; 2,258 ± 419.1 vs. 2,933 ± 962.4 dyn·s·cm⁻⁵, p=0.008) were significantly lower in the baseline PAH group vs. healthy groups respectively at supine rest. At peak exercise, heart rate (HR) was lower in the PAH group vs. healthy control group (140 ± 13.3 vs. 170 ± 13.8 bpm, p=0.001) and SVRI higher in the PAH group (828 ± 141.1 vs. 824 ± 300.9 dyn·s·cm⁻⁵, p=0.050) when controlling for age and HR. After AET, the PAH group did not have a significant decline in left ventricular function, but rather a decrease in SVRI (828 ± 141.1 vs. 766 ± 139.6 dyn·s·cm⁻⁵, p=0.020) at peak exercise. The subset of subjects with PAH who participated in the 10-week waiting period had a significant decline in the early diastolic left ventricular filling ratio (EDFR; 95.9±19.4 vs. 76.2±18.9%, p=0.043) at peak exercise. The EDFR remained unchanged after the AET training period in all subjects.

CONCLUSIONS: Vigorous AET does not appear to be associated with significant declines in either left ventricular systolic or diastolic function in women with PAH. AET may be beneficial for reducing afterload and may be protective against decline in left ventricular diastolic function occurring over time.

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**2070**  
**Board #33**  
June 3, 3:30 PM - 5:00 PM  
**Oxygen Consumption During Performance Of Functional Activities After Stroke**  
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(No relationships reported)

PURPOSE: People with stroke have low aerobic capacity and experience increased effort during performance of functional daily activities. The purpose of this study was to examine the test-retest reliability of a portable ergospirometry system in people with stroke during performance of five different daily activities.

METHODS: Patients with the diagnosis of stroke (minimum 4 months and maximum 5 years after onset) were screened for inclusion. Participants performed the following standardized test-course; walking on flat surface, stair walking, stepping over obstacles, walking between 8 cones and from a standing position lifting 5 objects with their non affected arm from one height to another. Participants performed the course on two different days, at least 2 days apart, with simultaneous measurement of oxygen uptake (VO2) with the portable MetaMax II, ergospirometry system. Intraclass correlations coefficients (ICC) for total time, cardiopulmonary parameters, heart rate and ratings of perceived exertion were calculated.

RESULTS: A total of 31 participants (39% women, mean age 54.5 years and 21.1 months since stroke) with mild to moderate stroke were included. The ICC was 0.89 for absolute VO2, 0.80 for relative VO2, 0.82 for minute ventilation, 0.54 for respiratory exchange ratio, 0.91 for heart rate and 0.81 for Borgs rating of perceived exertion. The ICC for total time to complete the test-course was 0.99.

CONCLUSIONS: This study presents evidence on the test-retest reliability of oxygen uptake measures wearing a portable ergospirometry system during ADL in persons with mild to moderate stroke. For most relevant cardiopulmonary parameters there were good test-retest reliability.