METHODS: We assessed the 6MWD in 337 community dwelling older adults (mean age 65 years, 225 males, 158 African American, BMI=29.4), following ATS guidelines. We separated groups by primary disease status [type 2 diabetes only (DM, n=117), moderate/severe chronic obstructive pulmonary disease (COPD, n=119), chronic kidney disease (CKD, n=40), peripheral artery disease (PAD, n=16), and moderate chronic heart failure (HF, n=45)].

RESULTS: The mean 6MWD across groups was 389 (103) meters. By disease, the mean 6MWD was 222 (78) m for HF, 364 (25) m for PAD, 425 (108) m for COPD, 458 (110) m for CKD, 477 (104) m for DM. Normative values of older adults are commonly considered to be 514 meters with the 10th percentile reported at approximately 334-361 meters. Our finding of a mean 6MWD of 389 m suggests low physical functioning status across older adults with chronic disease. Only the HF group met criteria for being in the 10th percentile although the PAD group also showed significant decline in physical function. A 6MWD of less than the 25 percentile (<470 m) is considered low functioning status. Our mean 6MWD was substantially lower than the 25th percentile in all groups except for the DM group.

CONCLUSIONS: We found that the mean 6MWD is lower in patients with HF and PAD, placing these patients at a high risk for loss of ability to conduct activities of daily living and eventually loss of independence, however all groups exhibited reduced physical function. This study highlights the importance of interpreting the 6MWD based on individual health conditions and that generalization based on 6MWD cannot be made without taking individual health conditions into account. Establishing a data register would capture data based on health conditions and enable the 6MWD to be used across disease states in a clinical setting and when prescribing exercise therapy for older adults with chronic disease.

1466 Board #274 May 31 9:00 AM - 10:30 AM

Cardiorespiratory Fitness Is Inversely Associated With Metabolic Syndrome And Clustering Of Metabolic Risk Factors: The Ball State University Adult Physical Fitness Study

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(No relevant relationships reported)

The metabolic syndrome (MetSyn) is a high-risk phenotype characterized by the clustering of cardio-metabolic risk factors (RF), including obesity, elevated triglycerides, high density lipoproteins, hypertension, and impaired fasting glucose. Cardiorespiratory fitness (CRF) has been associated with metabolic RF clustering and the presence of MetSyn. Most studies assessing this relationship have estimated CRF, which is associated with estimation error up to 40%, with only few studies using directly measured CRF assessed from cardiopulmonary exercise testing (CPX). However, these studies were small in size and predominately assessed men; therefore more information from studies using CPX derived CRF in both sexes may aid in the risk assessment for MetSyn and guide clinical decisions.

PURPOSE: To assess the association between directly measured CRF and MetSyn RF clustering.

METHODS: A retrospective cross-sectional analysis was performed on 3,636 self-referred men and women who completed a health assessment including a CPX between 1969-2017. Inclusion criteria consisted of being ≥ 18 years of age, attainment of a respiratory exchange ratio ≥1.0 during CPX, and complete data on MetSyn RFs. Sequential regression models were run to assess the relationship between CRF and MetSyn and a univariate analysis of variance was performed to assess differences between number of MetSyn RF present and CRF.

RESULTS: Individuals with MetSyn (n=953) had a mean CRF 8.8 ml/kg/min lower than those without the syndrome (n=2683). Number of RFs was inversely related to CRF; CRF was significantly lower ($p<0.05$) with each additional RF. There was also a negative relationship ($p<0.001$) between CRF quartile and the likelihood of having MetSyn. Each quartile increment was associated with a 50% relative reduction in likelihood of MetSyn ($p<0.001$).

CONCLUSION: These findings with CPX measured CRF suggest that higher levels may confer resistance to developing metabolic RFs, which could prevent MetSyn, and ultimately decrease cardiovascular disease risk. Further, the inverse, graded relationship between CRF and number of MetSyn RFs has public health importance, as adoption of an endurance training program may increase CRF, and therefore should be promoted as an approach to improve health and decrease MetSyn risk.

1467 Board #275 May 31 9:00 AM - 10:30 AM

Physical Activity Patterns And Cardiorespiratory Fitness In Men With Cardiovascular Disease

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(No relevant relationships reported)

PURPOSE: Cardiorespiratory fitness (CRF) is generally regarded as an objective and reproducible measure of recent habitual physical activity (PA). Considering that the majority of daily PA is performed at light intensity, it is likely that CRF benefits will be detected at submaximal rather than maximal exercise. The purpose of this study was to evaluate daily minutes of light (LIPA), moderate (MIPA) and vigorous (VIPA) intensity physical activity among men with cardiovascular disease (CVD), and to determine the relation between PA and submaximal (oxygen uptake efficiency slope (OUES)) and maximal ($\dot{V}O_2$ peak) indices of CRF.

METHODS: A total 32 male participants (mean (± SD): age of 60.0 ± 8.7 yr, $\dot{V}O_2$ peak, 2.0 ± 0.45 L/min and 23.3 ± 5.7 mL/kg/min) were recruited during an induction to a community based exercise referral program following completion of phase 2 cardiac rehabilitation. Participants underwent a graded exercise test on a cycle ergometer with breath by breath open circuit spirometry after which they wore a wrist worn accelerometer (Actigraph) for 7 d. Absolute and relative submaximal OUES were calculated by plotting $\dot{V}O_2$ in mL/min on the x axis, and the log transformed VE on the y axis ($VO_2 = a \log_{10} VE + b$). Exercise data up to the ventilatory anaerobic threshold was included in the analysis.

RESULTS: Participants performed 589.05 ± 69.41 min of daily LIPA, 161.38 ± 66.16 min of MIPA and no daily min of VIPA. There was no significant relation between peak $\dot{V}O_2$ and either LIPA or MIPA. There was a significant correlation between submaximal OUES (r=0.44; p<0.01) and LIPA. The relation between submaximal OUES/kg and LIPA min almost reached statistical significance (r=0.33; p<0.07). There was no significant relation between MIPA and OUES or OUES/kg.

CONCLUSIONS: Men with CVD spend the majority (78%) of their day performing LIPA. OUES, a submaximal measure of CRF was related to LIPA whereas no relation was found between $\dot{V}O_2$ peak and LIPA.

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Firefighters and Physical Function: Should There Be Annual Testing?

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(No relevant relationships reported)

There are more than a million actively employed firefighters in the United States. To qualify as a firefighter, one must pass the Candidate Physical Ability Test (CPAT), a vigorous assessment of strength and endurance. Following the CPAT, there is no national or state mandate to evaluate fitness or uphold a standard of minimum physical competency. Although strength, endurance, and mobility are critical to job performance, data concerning the preservation of function throughout a firefighter's career are scarce.

PURPOSE: To evaluate the physical functioning of firefighters.

METHODS: We enrolled 35 firefighters in California, collected demographic data, and performed a battery of tests, which included anthropometric assessments, grip strength, sit-and-reach, shoulder flexibility, vertical jump, push-ups, curl-ups, and VO_2 max. We compared mean data to normative data and used multiple linear regression to test the effect of age on physical functioning, holding potential confounders constant.

RESULTS: On average, firefighters were 33.5 ± 11.8 years of age and performed 23.9 ± 3.1 curl-ups, 32.2 ± 12.3 push-ups, had a vertical jump of 59.6 ± 10.4 cm, mean L/R grip strength of 66.0 ± 12.9 kg, sit-and-reach of 5.2 ± 9.1 cm, shoulder flexibility of 20.2 ± 6.8 cm, and VO_2 max of 40.1 ± 10.8 ml/kg/min. Compared to normative data, the mean firefighter had excellent grip strength, excellent push-ups, above average vertical jump, average shoulder flexibility, below average curl-ups, poor sit-and-reach, and poor VO_2 max; 94.1% of firefighters were classified as poor in sit-and-reach and 58.1% were classified as poor or very poor in VO_2 max. Linear regression did not find age to be a significant predictor of sit-and-reach (p=0.167) or VO_2 max (p=0.319) holding other significant predictors constant.

CONCLUSION: In general, firefighters performed competently in assessments of strength, but poorly in flexibility and aerobic capacity. Age was not a significant predictor of performance in either assessment; the implication is that duration spent as a firefighter is not related to functional decline. There may not be a need for firefighters to complete periodic CPAT assessments, but they should be encouraged to improve capacities of endurance and flexibility.