News Release

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Press conference time: May 16, 11:15 a.m. in the ATS Press Room (E-1)

Poster session time: 8:15- 10:45 a.m. May 16
Location: CC-Room 293-294 (Second Level), Morial Convention Center

A More Active Lifestyle Crucial for Day-to-Day Function in COPD Patients

ATS 2010, NEW ORLEANS— There is no magic bullet to help patients with COPD improve their ability to function in daily life. In fact, the best advice they might get is "do by doing," according to research to be presented at the ATS conference in New Orleans.

The results will be presented at the ATS 2010 International Conference in New Orleans.

Inactivity is known to be associated with a decrease in exercise tolerance, but it was unknown whether the reduced amount of physical activity alone was responsible for the reduction in functional exercise tolerance and maximal exercise capacity, or if the decreased intensity of the performed activities also played a role.

"We looked at the functional exercise tolerance in patients with COPD—that is, the distance they were able to walk during the six-minute walk test—and related it to the amount of daily activity they were able to maintain," said Chris Burtin, P.T., M.Sc. "We found that patients with a higher amount of daily activities also had higher scores on the six-minute walk test."

In contrast, patients' *maximal* exercise tolerance was unaffected by their daily activity, and more likely to be affected by disease severity, and the intensity, rather than the amount, of performed activities.

"Knowledge of these relationships is of utmost importance when developing interventions aiming at improvement of functional or maximal exercise capacity," explained Mr. Burtin. "These findings confirm that intensity of the performed activities is crucial when the intervention aims at improving physical fitness."

"An optimal long-term functional status should always be a general treatment goal in patients with chronic diseases," he continued. "Without disparaging the importance of formal exercise training in tackling the problem of deconditioning, our results also underline the importance of inducing behavioral changes towards a more active lifestyle in inactive patients. According to our findings, COPD patients who wish to improve their ability to perform daily tasks may be better served by increasing the normal daily activities such as walking to the post office, working in the garden or doing the housekeeping, rather than performing intense exercise once in a while."

As a physical therapist, Mr. Burtin stresses the importance of integrating healthy change into people's lives as seamlessly as possible. "If patients relapse into a sedentary lifestyle after terminating the program, this may negatively influence the long-term effects on functional status," he explained. "The key point in this intervention is to find activities which the patient enjoys to do, in order to increase the chances of long-term adherence."

In future research, Mr. Burtin intends to further investigate the relationship between physical activity and other aspects of disease progression. "It would be interesting to further explore the relationship between levels of physical activity and different aspects of health-related quality of life and moreover whether changes in activity behavior could induce long-term improvements in quality of life," he said.

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"Relationship Between Amount and Intensity of Physical Activity in Daily Life and Exercise Tolerance in COPD" (Session A27, Sunday, May 16, 8:15-10:45 a.m., CC-Room 293-294 (Second Level), Morial Convention Center; Abstract 2821)

**Please note that numbers in this release may differ slightly from those in the abstract. Many of these investigations are ongoing; the release represents the most up-to-date data available at press time.*

Relationship between amount and intensity of physical activity in daily life and exercise tolerance in COPD

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Rationale. Both the amount and intensity of physical activities in daily life (PA) are markedly decreased in COPD patients. It is unclear whether only the amount or also the intensity of physical activity contribute to reduced exercise capacity in COPD. In particular it is not studied whether peak and functional exercise tolerance are determined by similar or different features of daily life. The present study investigated factors related to exercise tolerance, including physiological variables and amount and intensity of PA.

Methods. Functional (six-minute walk distance: 6MWD) and peak (maximal oxygen consumption (VO_2max) and maximal workload (Wmax)) exercise tolerance were assessed in 40 outpatients with COPD (Age 66±8, $FEV_1$42±16%pred). PA was measured during 7 consecutive days and mean daily values were calculated. A Dynaport Minimod activity monitor (McRoberts, The Hague, The Netherlands) was used to assess daily number of steps and daily walking time. A Sensewear Pro activity monitor provided information on the time spent in and the energy expenditure during activities performed at an intensity exceeding 3 metabolic equivalents (EE>3METs). Multiple regression models were applied using 6MWD, VO_2max and Wmax as dependent variables and PA outcomes, age, gender, body mass index (BMI), FEV_1, TLco and quadriceps force as independent variables.

Results. The daily number of steps, quadriceps force and BMI significantly contribute to the prediction of 6MWD. TLco, BMI, FEV_1 and EE>3METs are significantly contributing to the model explaining VO_2max. Quadriceps force, FEV1 and EE>3METs significantly predict Wmax. Quadriceps force is moderately correlated with EE>3METs (r=0.37, p=0.02) but not with time spent in activities above 3METs nor with the daily number of steps. Regression coefficients, explained variance (R^2) and significance level (p) of variables that contribute significantly to the models are reported in Table 1.

	Regression coefficient	**Explained variance (R^2)**	**Significance level (p)**
6MWD (m)			
Number of steps	0.015	0.35	0.0002
Quadriceps force (Nm)	1.42	0.16	0.0004
BMI (kg/m^2)	-4.13	0.05	0.05
VO_2max (ml/min)			
TLco (%pred)	170.73	0.48	<0.0001
BMI (kg/m^2)	31.92	0.14	0.0004

FEV_1 (%pred)	7.69	0.11	0.0006
EE > 3METs (kCal)	0.40	0.06	0.0054
Wmax (Watt)			
Quadriceps force (Nm)	0.51	0.43	<0.0001
FEV_1 (%pred)	0.64	0.18	0.0002
EE > 3METs (kCal)	0.026	0.07	0.0143

Conclusions. Whereas functional exercise tolerance (measured with 6MWD) is primarily related with the amount of daily physical activities (quantified by daily number of steps), maximal exercise capacity is more closely related to factors associated to disease severity and to the intensity of the performed activities. These data may have consequences for the design of intervention studies. If interventions seek to enhance functional exercise capacity, it could be speculated that any increase in daily activity may help achieving this goal. In order to induce changes in peak exercise tolerance, exercise at higher intensities is probably needed. Further prospective research is needed to confirm these associations in intervention studies.