Assessments of physical performance in elderly manual workers

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INTRODUCTION
The world’s proportion of elderly above the age of 60 years is said to almost double by the year 2050 [1]. Due to a longer life expectancy, the Danish Parliament recently decided to increase retirement age [2], thereby increasing the amount of elderly workers. However, this increase in retirement age may not be favourable for elderly with physically demanding occupations. The age-related loss of physical performance coupled a potential work-related acceleration of this process may leave some workers unable to perform the physical requirements of their jobs; thus, an increase in retirement age could be problematic for manual workers subjected to physical loads throughout their working life [3].

Too little is known about the variations in physical performance of elderly manual workers [4], especially during the two last decades of working life. Accordingly, this study seeks to delineate the effects of both age and work on physical performance among manual workers aged 50-70 years.

METHODS
In this cross-sectional study, we will explore the variations in physical performance of 100 elderly (age 50-70 years) Danish manual workers [5]. Subjects will be recruited upon receiving their affirmative response to a questionnaire, which will be sent out to more than 5000 Danish manual workers. The selection will aim to ensure representability over the age-range by recruiting in intervals of five years from 50 to 70 years.

Physical performance will be assessed using several methods (Fig. 1): The inflammatory biomarkers C-reactive protein and interleukin-6 will be measured from venous blood samples (1). Body composition (i.e. fat mass and fat-free mass) will be estimated using bioelectrical impedance analysis (2). Lung function will be assessed using spirometry (3). Static balance will be assessed during quiet standing on a force platform (4), dynamic balance will be measured during a chair-stand motion with five rises as fast as possible (5). Movement variability will be tracked during a hammering task using two motion trackers (6). Handgrip strength and endurance will be measured with a hand dynamometer (7). Fitness (aerobic capacity) will be estimated during steady-state cycling on a bicycle ergometer (8). Flexibility of the spine and pelvis will be assessed with a fingertip-to-floor test (9).

Lastly, the subjects will answer a short questionnaire about general health, smoking habits, leisure-time physical activity, work ability, and musculoskeletal pain and discomfort.

REFERENCES