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Isokinetic and isometric muscle strength in a healthy population with special reference to age and gender.

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Abstract

AIM: Muscle strength is an excellent indicator of general health when based on reliable measurements. Muscle strength data for a healthy population are rare or non-existent. The aim of the present study was to measure a set of normal values for isometric and isokinetic muscle strength for all the major joint movements of the body and, from these data, to create a basis for comparison of the muscle strength of an individual with the expected value in a normal population.

METHODS: A randomly selected group, aged 20-80 years, from the Copenhagen City Heart Study were studied. The group was subgrouped according to age and gender. Isometric and isokinetic muscle strength was measured in each subject across the main joints in the body. A statistical model was developed that encompassed the three main muscle groups: upper limbs, trunk and lower limbs. **RESULTS:** Muscle strength in healthy men decreases in a linear fashion from the age of 25 years down to between 54% and 89% at the age of 75 years, and seems not highly dependent on any other parameter than age. For women, the muscle strength is dependent on weight and is only related to age from around 40 years of age. The decrease in muscle strength from the age around 40 to 75 years is 48-92%. For most muscle groups, men are 1.5-2 times stronger than women, with the oldest men having strength similar to that observed among the youngest women. **CONCLUSION:** We developed a model to compare the isometric and isokinetic muscle strength of all the major joint movements of an individual with values for a healthy man or woman at any age in the range of 20-80 years. In all age groups, women have lower muscle strength than men. Men's muscle strength declines with age, while women's muscle strength declines from the age of 41 years.

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