

Your exercise performance is a better predictor of longevity than your chronological age

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Combining aerobic and resistance training may offer the most benefits for women during and after chemotherapy for breast cancer, according to a new U of A study. The research also showed that women who included resistance training in their workouts were more likely to stick with regular exercise after their cancer treatment.. Credit: CC0 Public Domain

Sophia Antipolis, 14 February 2019: It's often said: It's not how old you are, it's how old you feel. New research shows that physiological age is a better predictor of survival than chronological age. The study is published today in the *European Journal of Preventive Cardiology*, a journal of the European Society of Cardiology (ESC).

"Age is one of the most reliable risk factors for death: the older you are, the greater your risk of dying," said study author Dr. Serge Harb, cardiologist at the Cleveland Clinic in the United States. "But we found that physiological health is an even better predictor. If you want to live longer then exercise more. It should improve your health and your length of life."

Based on exercise stress testing performance, the researchers developed a formula to calculate how well people exercise—their "physiological age—which they call A-BEST (Age Based on Exercise Stress Testing). The equation uses exercise capacity, how the [heart](#) responds to exercise (chronotropic competence), and how the [heart rate](#) recovers after exercise.

"Knowing your physiological age is good motivation to increase your exercise performance, which could translate into improved survival," said Dr. Harb. "Telling a 45-year-old that their physiological age is 55 should be a wake-up call that they are losing years of life by being unfit. On the other hand, a 65-year-old with an A-BEST of 50 is likely to live longer than their peers."

The study included 126,356 [patients](#) referred to the Cleveland Clinic between 1991 and 2015 for their first exercise stress test, a common examination for diagnosing heart problems. It involves walking on a treadmill, which gets progressively more difficult. During the test, exercise capacity, heart rate response to exercise, and heart rate recovery are all routinely measured. The data were used to calculate A-BEST,

taking into account gender and use of medications that affect heart rate.

The average age of study participants was 53.5 years and 59% were men. More than half of patients aged 50-60 years—55% of men and 57% of women—were physiologically younger according to A-BEST. After an average follow-up of 8.7 years, 9,929 (8%) participants had died. As expected, the individual components of A-BEST were each associated with mortality.

Patients who died were ten years older than those who survived. But A-BEST was a significantly better predictor of survival than chronological age, even after adjusting for sex, smoking, body mass index, statin use, diabetes, hypertension, coronary artery disease, and end-stage kidney disease. This was true for the overall cohort and for both men and women when they were analysed separately.

Dr. Harb said doctors could use A-BEST to report results of exercise testing to patients "Telling patients their estimated age based on exercise performance is a powerful estimate of longevity and easier to understand than providing results for the individual components of the examination."

Dr. Harb noted that this type of approach has shown merit in specific disease areas. For example, ESC guidelines advocate using "cardiovascular risk age—based on risk factors including smoking, blood cholesterol and blood pressure—to communicate with patients.²

More information: Serge C Harb et al, Estimated age based on exercise stress testing performance outperforms chronological age in predicting mortality, *European Journal of Preventive Cardiology* (2019).
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