

## **ABSTRACT**

**THESIS:** Ventilatory Threshold and All-Cause Mortality in Apparently Healthy Adults

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**BACKGROUND:**  $VO_{2max}$  is well established to have a strong relationship to all-cause mortality, however, ventilatory threshold is emerging as a novel variable for predicting outcomes in some populations. **PURPOSE:** To examine the relationship between ventilatory threshold and all-cause mortality in apparently healthy men and women. **METHODS:** 1440 participants (760 men, 680 women) from the Ball State Adult Fitness Longitudinal Lifestyle Study (BALL ST) cohort with a mean age of  $45.4 \pm 13.0$  years performed maximal cardiopulmonary exercise testing to assess  $VO_{2max}$  and ventilatory threshold (VT) between January 1992 and December 2016. Participants were followed for an average of  $15.5 \pm 8.4$  years after testing for mortality endpoints. Cox proportional hazard models were completed to determine the relationship between VT and mortality, with VT as a continuous variable. **RESULTS:** During the follow-up period there were 104 mortality events. After adjusting for age, sex, CVD risk factors, and year of testing, there was a 29.8% (HR: 0.919, 0.870-0.970 95% CI) reduction in all-cause mortality risk per 1 metabolic equivalent higher VT ( $p < 0.01$ ), however, the relationship between VT and all-cause mortality was not independent of  $VO_{2max}$ . Comparatively, for every 1 metabolic equivalent higher  $VO_{2max}$ , participants were at a 22.4% (HR: 0.938, 0.902-0.976 95% CI) lower risk for all-cause mortality ( $p < 0.01$ ). **CONCLUSION:** Higher VT was associated with lower risk of all-cause mortality in apparently healthy men and women but was not independent of  $VO_{2max}$ . VT may have the ability to be used in the place of  $VO_{2max}$  when being used to predict outcomes when a maximal exercise test is not available.