

## BACKGROUND

- Patients with cancer often present with attenuations in cardiorespiratory fitness (CRF) as a direct or indirect (i.e. deconditioning) result of anti-cancer therapies.
- Pulmonary, cardiovascular and skeletomuscular systems experience impairments in oxygen transport and utilization, effecting ATP synthesis.
- The gold standard in assessing CFR in a clinical setting is the evaluation of peak oxygen consumption (VO<sub>2peak</sub>) measurements, which reflects the body's ability to deliver and utilize oxygen efficiently.
- Exercise training has shown to be effective in increasing VO<sub>2</sub>peak measurements as well as mitigating CRF impairments induced by oncological treatments.

## PURPOSE

To evaluate the effects of exercise interventions on VO<sub>2</sub>peak measurements among cancer patients with reduced cardiorespiratory fitness levels.

## RATIONALE

Exposure to oncological therapy is attributed to a decline in CRF, which in turn predisposes cancer patients to a significantly higher risk for treatment-related toxicity and mortality. Historically, clinicians suggested cancer patients should avoid physical activity as not to exacerbate treatment-related symptoms. However, emerging evidence observing the effects of exercise interventions among cancer patients has shown the development of cardioprotective adaptations that cause significant improvements in VO<sub>2</sub>peak measurements, as well as improved muscular strength and quality of life. This is especially significant given the evidence of the inverse relationship between CRF levels and mortality risk in patients with cancer, as seen in *figure 1*.

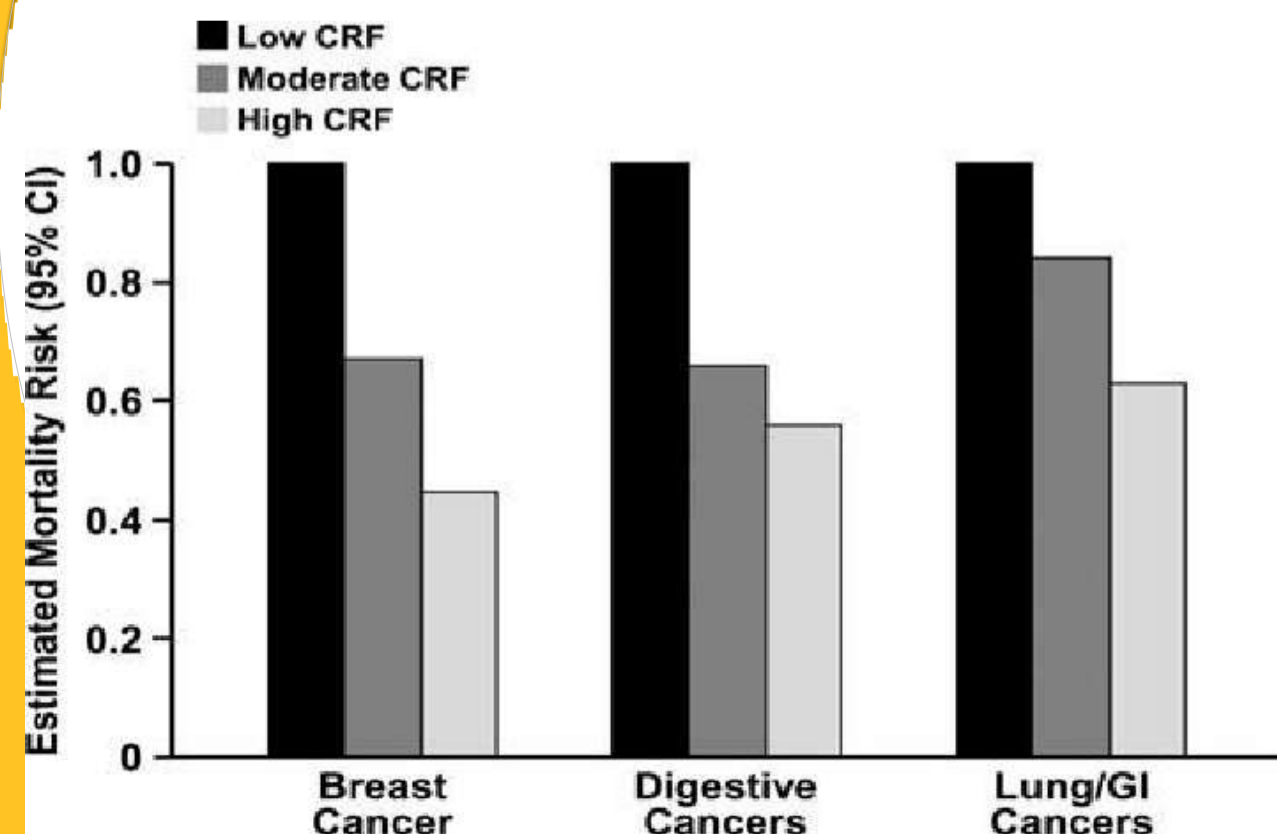


Figure 1. The inverse relationship between cardiorespiratory fitness and cancer mortality.

## RESULTS

Exercise training in various cancer populations displays significant improvements in VO<sub>2</sub>peak measurements and the attenuation of treatment-related CRF decline. A summary of these results is displayed in *Table 1*.

Cancer Type	VO <sub>2</sub> peak improvements
Breast	↑ 1.83±0.68 mL/kg/min
Prostate	↑ 1.9±.06 mL/kg/min
Testicular	↑ 3.70 mL/kg/min
Colorectal	↑ 1.22 mL/kg/min
Mixed (meta-analysis)	↑ 2.80 mL/kg/min

Table 1. Results of exercise on cardiorespiratory fitness in patients with different types of cancer who have received adjuvant therapy.

## CONCLUSIONS

- The most effective exercise prescriptions are individualized to the patient's specific diagnosis and treatment. The American College of Sports Medicine recommends cancer patients to participate in a total of 150 minutes of moderate aerobic training a week (spread over 3-5 days) and resistance training of major muscle groups at least 2 days per week consisting of 2 sets of 8-10 repetitions.
- Improved VO<sub>2</sub>peak measurements translate to improved CRF, which is inversely related to mortality among cancer patients.
- Implementing exercise among cancer patients is effective in inducing cardioprotective adaptations that mitigate adverse affects that cause reduced CRF levels.

## REFERENCES

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