Exercise Testing and Prescription With Cancer Patients to Help Relieve Cancer-Related Fatigue (CRF)

Department of Exercise Science, Gardner-Webb University, Boiling Springs, NC

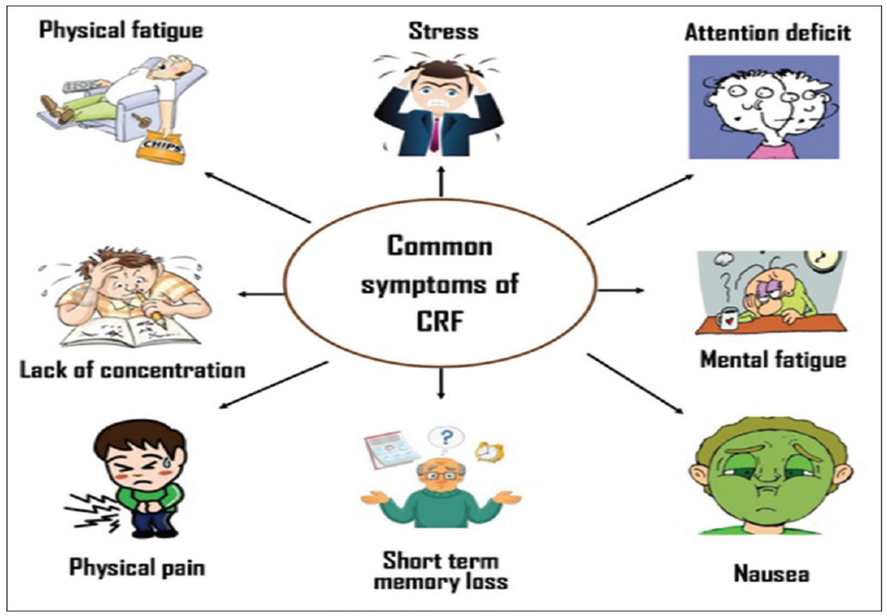
Tanner Hendricks and Paul Williams

INTRODUCTION

- CRF is one of the most prominent side effects in cancer patients (Savina & Zaydiner, 2019)
- 80-100% of cancer patients report experiencing CRF (American Cancer Society, 2020)
- Rest was a crucial recommendation for cancer patients, but now it is being replaced with physical activity (Backer et al., 2007)
- CRF can lead to: (Horneber et al., 2012)
  - Decreased physical activity
  - Hinderance of recovery
  - Mood swings (depression often occurs)
  - Exhaustion (physical and mental)
  - Impaired physical performance

EXERCISE TESTING

- Physical activity can improve aerobic capacity, muscular strength, body composition, and quality of life (Backer, 2007)
- Short Ramp Test (Bongers et al., 2013)
  - **Short maximal exercise test** performed on cycle ergometer
  - Does not require gas analysis
  - Reflection of **anaerobic power** and leg strength
- **Muscular Strength and Endurance** (Sprod, 2009)
  - Handgrip Dynamometer (Muscular Strength)
    - Easy, inexpensive, and reliable
    - Not affected by anxiety or depression
    - 30 second Arm Curl Test on machine (Santos, 2019) (Muscular Endurance)
    - Leg Press Test (Santos et al., 2019) (Muscular Endurance)
      - 10-RM
  - **Body Composition** (Mueller et al., 2020)
    - Bioelectrical Impedance Analysis (BIA)
    - Helps prevent, diagnose, and prognose nutritional issues in cancer patients
    - Specific regression equations for BIA should be chosen in order to get an accurate measurement
  - **Flexibility/Balance** (Evans et al., 2021; Schneider et al., 2007)
    - Timed up and Go Test (Balance)
    - Modified Sit and Reach Test (Flexibility)



Mohandas, Jaganathan, Mani, Ayyar, and Thevi, 2017

EXERCISE PRESCRIPTION

Table 1

Exercise Programs Used for Patients During the Treatment of Cancer

Type of Cancer	Age	Duration (weeks)	Frequency (days)	Program (Exercise)	Intensity (%)	Results
Leukemia, Breast, Colon, and Ovarian	18-63	6	4	Cycling	60-100% MHR	16% increase in VO_2 Max
Leukemia, Breast, Colon, and Ovarian	18-63	6	4	Resistance (3 sets, 5-8 reps)	85-95% 1RM	32.5% increase in strength

Note. Information obtained from Jacobs (2017) & Adamsen et al. (2003). MHR = Maximum Heart Rate, 1RM = 1 Rep-Max, VO_2 Max = maximal volume of oxygen that is used by the body during exercise.

Possible/Desired Intervention Outcomes (Jacobs (2017)).

- Increased Energy
- Greater Cardiac Output
- Greater Cardiovascular Exchange
  - Leads to greater function within the cell in the presence of additional oxygen.
- Increased Joint Mobility
- Decreased Pain
  - Muscular and Skeletal
- Decreased recovery time
- Greater Quality of Life

Results of Prescription/ Timeline (Jacobs (2017)).

- Warm up 3-5 minutes (light aerobic exercise and stretching of major muscle groups)
- Exercise (see Table 1)
- Cool Down 3-5 minutes (light aerobic exercise and stretching repeated)
- Clients who are deconditioned should see progression as exercise continues
- Clients who are conditioned should see small improvements in overall strength and cardiovascular endurance.

SPECIAL CONSIDERATIONS

- Individuals with cancer are unique because physical activity has been shown to increase quality of life and the survival rate despite their genetic disease (Jacobs, 2017).
- Patients should ensure that exercise is approved before beginning (Jacobs, 2017)
  - Important when patient is receiving treatment because lungs and heart are affected
- Side effects from treatment include nausea, extreme fatigue, asthenia, dyspnea, and pain (Jacobs, 2017)
  - May make exercise difficult
  - Reduce intensity, terminate exercise, or see a physician as soon as possible if any of these side effects are evident

CONCLUSION

CRF affects and impairs a patient by causing disruption physically, mentally, and socially. For individuals in this population, exercise prescribed by a certified exercise physiologist can help relieve many of the factors that are associated with CRF such as physical fatigue, stress, lack of concentration, physical pain, short term memory loss, nausea, mental fatigue, and attention deficit.

Exercise programs for cancer patients have been shown to be safe and effective in the lives of cancer patients. The five components to living a healthy lifestyle (cardiorespiratory fitness, muscular strength and endurance, body composition, and flexibility/balance) should be incorporated into the exercise testing and programing.

All exercise testing and prescription with cancer patients should be supervised and within a hospital setting. During the later phases of treatment, patients may complete exercises outside of a hospital setting. Due to the decreased physical activity, depression, hinderance of recovery, exhaustion, and impaired physical performance that is related to CRF, supervision should still be provided for the alter phases of treatment.

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