# Literature Review of Prehabilitation Interventions and Outcomes for Gastrointestinal Cancers

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## Introduction

- *Prehabilitation* (prehab) is the stage of cancer rehabilitation between diagnosis and acute intervention that utilizes targeted physical activity to "reduce severity of current and future impairments".[1]
- The purpose of this literature review was to develop a theoretical framework for future research and guidance for implementation of effective prehab for gastrointestinal cancer survivors undergoing surgical treatment in Maine.

## Methods

- A literature review of 59 scholarly studies was conducted to analyze the type of exercise applied during prehabilitation programs as well as postoperative outcomes for gastrointestinal (GI) tumor resection.
- Studies published in English between 2013-2019 were included (21).
- Due to lack of available systematic reviews and randomized controlled trials, inclusion criteria was widened to include controlled clinical trials.

## Colorectal Cancer

**Unsupervised, Home-Based Intervention**

- Meaningful changes in postoperative functional exercise capacity can be achieved with a home-based program.[2]
- Participation had positive effects on physical activity levels and functional walking capacity within the 4-week preoperative period.[3]

**Supervised and Unsupervised Intervention**

- Four weeks of unsupervised prehabilitation is sufficient to modify exercise behavior.[3]
- OncoActive intervention provides opportunity to accelerate cancer recovery.[4]
- Participation in prehab reduces the chances of losing lean body mass.[5]
- Nutritional prehab can decrease length of hospital stay whether alone or paired with exercise.[6]
- Sedentary patients will benefit from prehab.[7]
- A prehab program instituted within the 4-5 week period between diagnosis and surgery is feasible for achieving clinically relevant effects in post-surgical recovery.[8]
- In frail patients undergoing colorectal cancer resection, a multimodal prehab program did not affect postoperative outcomes.[9]
- Trimodal prehab is associated with improved 5-year disease free survival in all stages of colorectal cancer.[10]
- Endurance and resistance training results in improvements in functional capacity based on 6-Minute Walk Distance.[11]
- A cardiopulmonary-based prehab program does not significantly reduce postoperative complications or length of hospital stay.[12]

## Pancreatic Cancer

**Unsupervised, Home-Based Intervention**

- Increase in physical fitness reduces postoperative complications, hospital stay, and associated costs.[13,14,15]
- Home-based intervention may improve patient adherence rates to exercise.[16,17]
- There are no significant differences between exercise adherence rates and phase of neoadjuvant therapy.[18]
- American College of Sports Medicine (ACSM) guidelines[19] for aerobic exercise present a reasonable target for patients with pancreatic cancer undergoing neoadjuvant therapies.[18]
- Aerobic exercise and full body strength training decrease postoperative pulmonary complications.[15]

**Supervised Intervention**

- Increases in muscle strength and body weight are more significant following supervised progressive resistance training.[17]

## Other Gastrointestinal Cancers

**Unsupervised, Home-Based Intervention**

- Aerobic exercise and strength training may mitigate surgery-related decline associated with malignant gastroesophageal lesions.[20]

**Supervised and Unsupervised Intervention**

- Prehab may decrease requirement of vasoactive drugs during surgery, rate of surgical complications, cardiovascular complications, risk of infection, paralytic ileus, as well as intensive care unit length of stay.[21]
- Exercise programs consisting of 15-60 minutes per session, 2-3 times per week, and aerobic and strength training movements, can cause improvements in cardiopulmonary fitness and functional capacity, and can be used for future goals in prehab programs.[22]

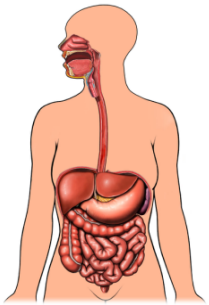
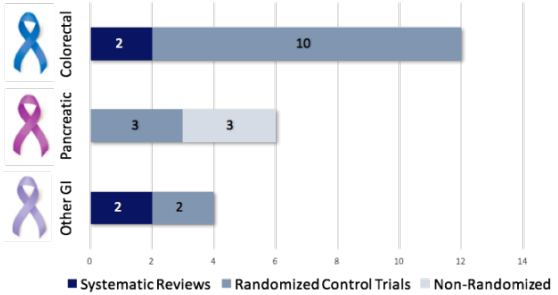


Figure 1. Gastrointestinal Tract

Figure 2. Research Evidence 2013-2019




## Conclusions

- Participation in a multi-modal prehab program is feasible for GI cancer survivors undergoing surgical intervention.
- It is important to note that many of the studies on unsupervised exercise initiated the program with a supervised introductory session.
- Future research should focus on multimodal, supervised prehab with objective monitoring of progress.[23]
- ACSM guidelines recommend the use of supervised physical activity for best outcomes following prehabilitation.[19]

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## References