Surgical Prehabilitation in Patients with Cancer

State-of-the-Science and Recommendations for Future Research from a Panel of Subject Matter Experts

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KEYWORDS

• Cancer • Surgery • Exercise • Nutrition • Prehabilitation • Anxiety • Outcome

KEY POINTS

- Surgical prehabilitation is the process on the continuum of care that occurs between cancer diagnosis and surgical treatment.
- Physiologic principles support the implementation of either unimodal or multimodal preoperative interventions in patients diagnosed with cancer and requiring surgical intervention.

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- Recommendations are proposed to advance research in surgical prehabilitation by identifying the role of exercise, nutritional optimization, and psychological stress reduction in order to increase physiologic reserves in anticipation of surgery.
- There is a need to determine the impact of prehabilitation on length of stay, unanticipated readmissions and emergency department visits, perioperative complications, short-term impairments, long-term impairments, late effects, and associated disability and delays to planned postsurgical oncologic treatment.

INTRODUCTION

Surgery remains a cornerstone of oncology treatment, and minimally invasive approaches, enhanced recovery pathways (ERPs), and other interventions have improved safety and patient outcomes.[1] However, despite these advances, major cancer resections of the bladder, pancreas, lung, or esophagus have mortalities of 4% to 9%[2] and high morbidities persist even for lower-risk procedures like colorectal resection, ranging from 25% to 50%.[3] Postoperative complications prolong hospital lengths of stay, increase readmissions and elevate costs, impact patient functioning and quality of life, and may have long-term implications on mortality.[4] Tissue trauma, reduced physical activity, quasi-starvation, and psychological distress associated with major surgery result in a rapid decline in functional capacity, followed by slow recovery.[5] At-risk populations, including the elderly, are more susceptible to the negative effects of surgical stress, and some never regain their baseline functioning. Poor preoperative fitness and physical status are risk factors for serious postoperative complications and prolonged disability.[6] Neoadjuvant oncologic therapies may be associated with additional degradations of physical fitness before surgery.[7]

The preoperative period may provide an opportunity to increase the physiologic reserve in the anticipation of neoadjuvant therapies and surgery with the intention to improve outcomes and accelerate recovery (Fig. 1).[8] Much as someone might train for any upcoming physical challenge, prehabilitation is a compelling strategy to address modifiable risk factors that impact cancer treatment outcomes.

Cancer prehabilitation is "A process on the cancer continuum of care that occurs between the time of cancer diagnosis and the beginning of acute treatment and

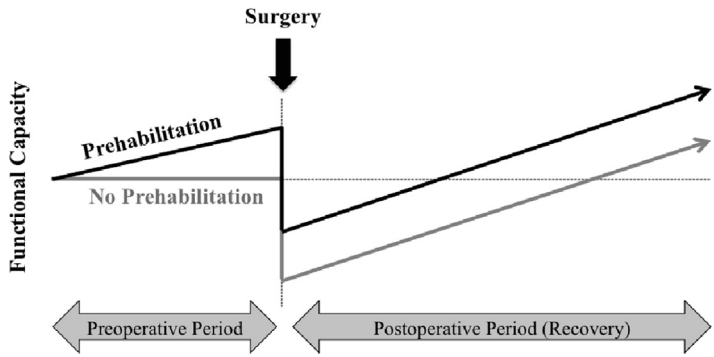

Fig. 1. Theoretic model of surgical prehabilitation based on the concept of increasing functional capacity before surgery. (*Adapted from* Carli F, Zavorsky GS. Optimizing functional exercise capacity in the elderly surgical population. Curr Opin Clin Nutr Metab Care 2005;8(1):25; with permission.)