Multimodal Prehabilitation Improves Postoperative Outcomes in Frail Surgical Oncology Patients

Atiya F. Dhala MD, FACP, Associate Professor of Clinical Medicine (afdhala@houstonmethodist.org)
Linda W. Moore PhD, Academic Director of Research (lwmoore@houstonmethodist.org)

*No one in a position to control the content of this educational activity has relevant financial relationships with ineligible companies

Learning Objectives

1. Create a comprehensive multimodal prehabilitation program (MMP) for older, frail, or sarcopenic patients scheduled to undergo major abdominal surgery with the goal of improving postoperative outcomes.
2. Identify the major tests or tools to assess the physical, nutritional, and psychological condition to qualify a patient for major surgery.
3. Differentiate the measurement and reassessment of patients after completion of a multimodal prehabilitation program using baseline and control groups.

Background

More than four of ten adults over 60 years will undergo intra-abdominal surgery during their lifetime.

30% Of those patients are expected to experience complications, including postoperative pulmonary complications (PPCs)

PPCs: pneumonia, unplanned intubations, and ventilator >48 hours postoperatively).[1,2]

Complex cancer surgery patients are likely to be frail, sarcopenic, and malnourished (FSM), leading to increased PPCs.

Goals

Early identification of **frailty**, **sarcopenia**, and **malnutrition** and prescribing **multimodal prehabilitation** intervention in order to improve patients' fitness for surgery, **reducing** postoperative pulmonary complications and length of stay.

Interventions- Multimodal Prehabilitation Program

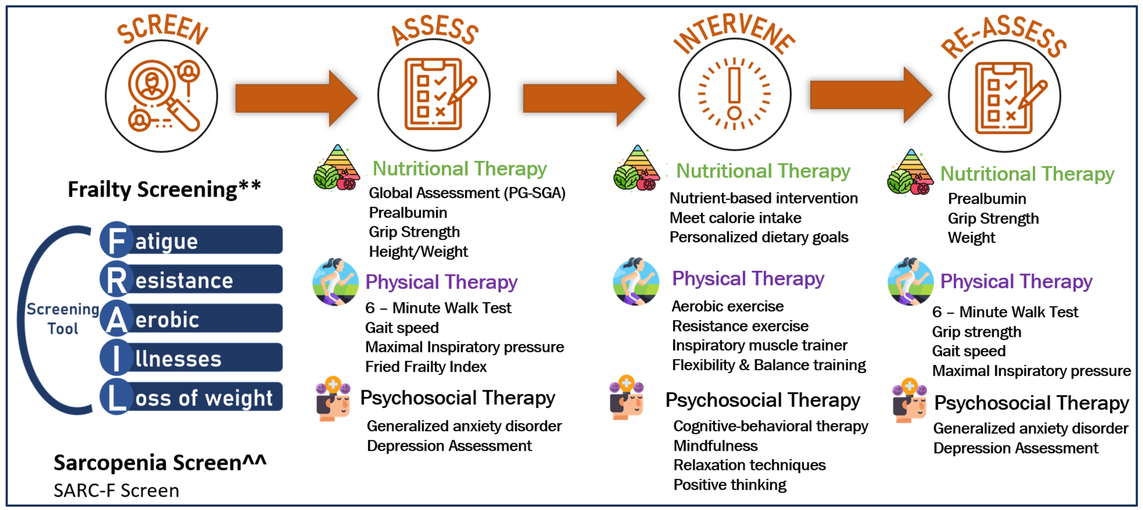

Figure 1. Multimodal Prehabilitation Program
** **Frailty Screening: Fatigue** - Are you fatigued? **Resistance**- Can you walk up 1 flight of stairs? **Aerobic:** Can you walk more than a block? **Illnesses:** Do you have more than 5 illnesses? **Loss:** Have you lost > 5% of your weight in the past 6 months? Scoring: Prefrail: 1-2 points; Frail >/= 3 points.
^^ **Sarcopenia Screen:** Malmstrom TK, Morley JE. SARC-F A simple questionnaire to rapidly diagnose sarcopenia. J Am Med Dir Assoc. 2013 Aug 14(8):531-2.

Outcomes

Procedure Group	Case Group	Cases	Actual ALOS	Avg ICU Days	Expected ALOS	LOS Index
Esophagus	Prehab	8	11.00	2.41	11.23	0.98
	Control	14	14.85	7.92	14.39	1.03
Esophagus Total		**22**	**13.50**	**5.82**	**13.29**	**1.02**
Excision of Pancreas/Liver	Prehab	10	10.50	2.07	9.71	1.08
	Control	118	11.72	3.28	8.55	1.37
Excision of Pancreas/Liver Total		**128**	**11.62**	**3.18**	**8.65**	**1.34**

Table 1. Multimodal Prehabilitation Program (small sample) Improved Outcomes
*Average Length of Stay (ALOS) = Total length of stay/Total number of discharges

Results

ALOS **ICU**

Hepatopancreatobiliary surgery patients who went through MMP experienced a lower actual average length of stay (ALOS) vs controls, as well as decreased average ICU days vs controls.

ZERO incidences of PPCs during the study period.

Similar results of lower ALOS and zero PPCs were observed in the other cancer patients in the MMP program.

Conclusions/Future Actions

Prehabilitation intervention is scalable with the potential to improve outcomes in a wider variety of elective complex surgeries.

MMP program **improves** patient safety through the **reduction** of **postoperative complications and ALOS.**

Lessons Learned

An individualized approach to prehabilitation is crucial for optimizing patient outcomes.

Incorporating AI can enhance the effectiveness of prehabilitation programs by enabling early detection and intervention

Key Takeaways

1. Multimodal prehabilitation reduces postoperative complications and length of stay
2. Early identification of frailty and personalized prehabilitation intervention produces better outcomes

References
(1) Nunoo-Mensah JW, et al. Prevalence of intraabdominal surgery: what is an individual's lifetime risk? South Med J. 2009;102(1):25-29; (2) Patel K, al. Postoperative pulmonary complications following major elective abdominal surgery: a cohort study. Perioper Med (Lond). 2016;5:10;