

Optimizing functional capacity by correcting malnutrition

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McGill



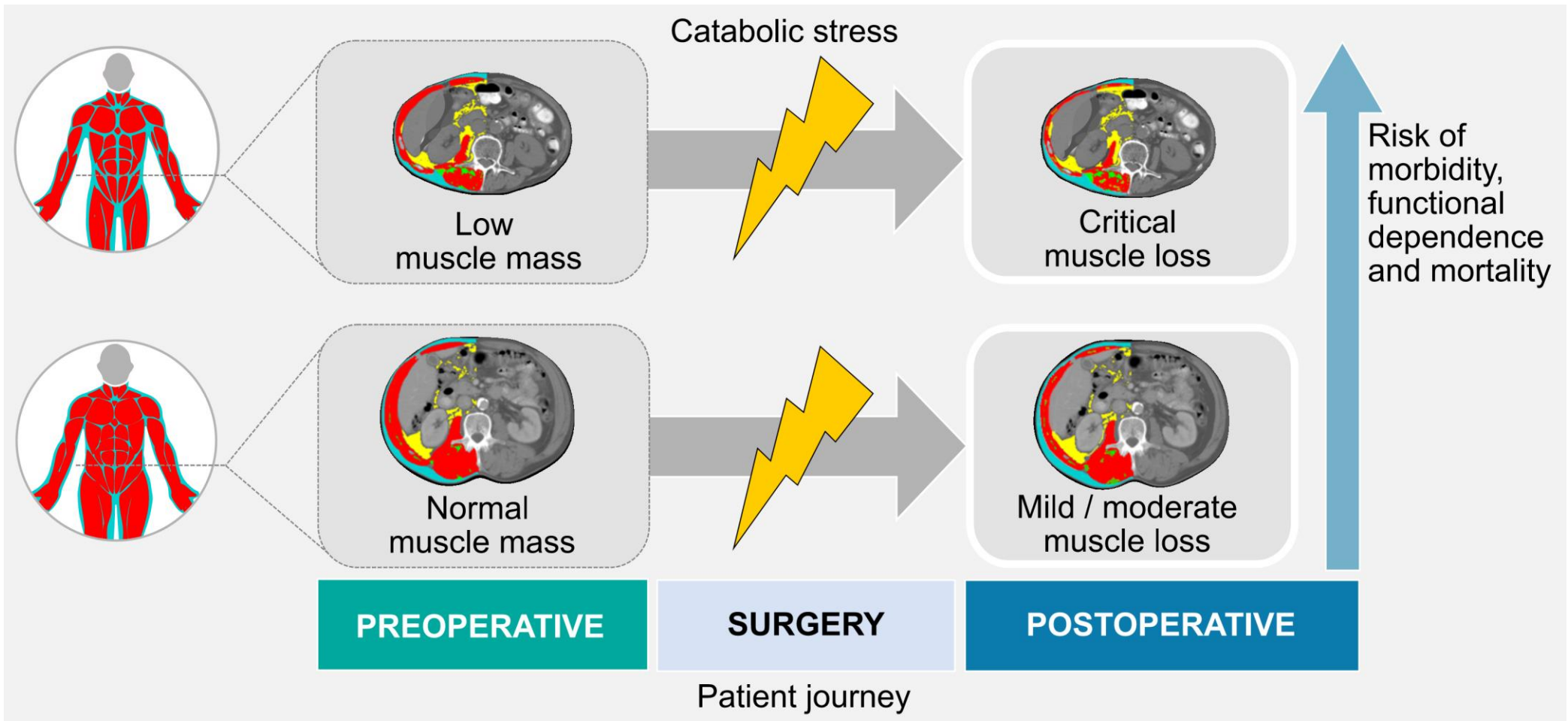
PERI OPERATIVE
PROGRAMME
PÉRI-OPÉRATEUR

PREHABILITATION: PARADIGM SHIFT

- Surgical recovery is NOT a passive process.
- Recovery begins BEFORE surgery.
- We proposed a new phase of recovery: Pre-surgery phase of recovery

Table 3 Phases with impact on surgical recovery.

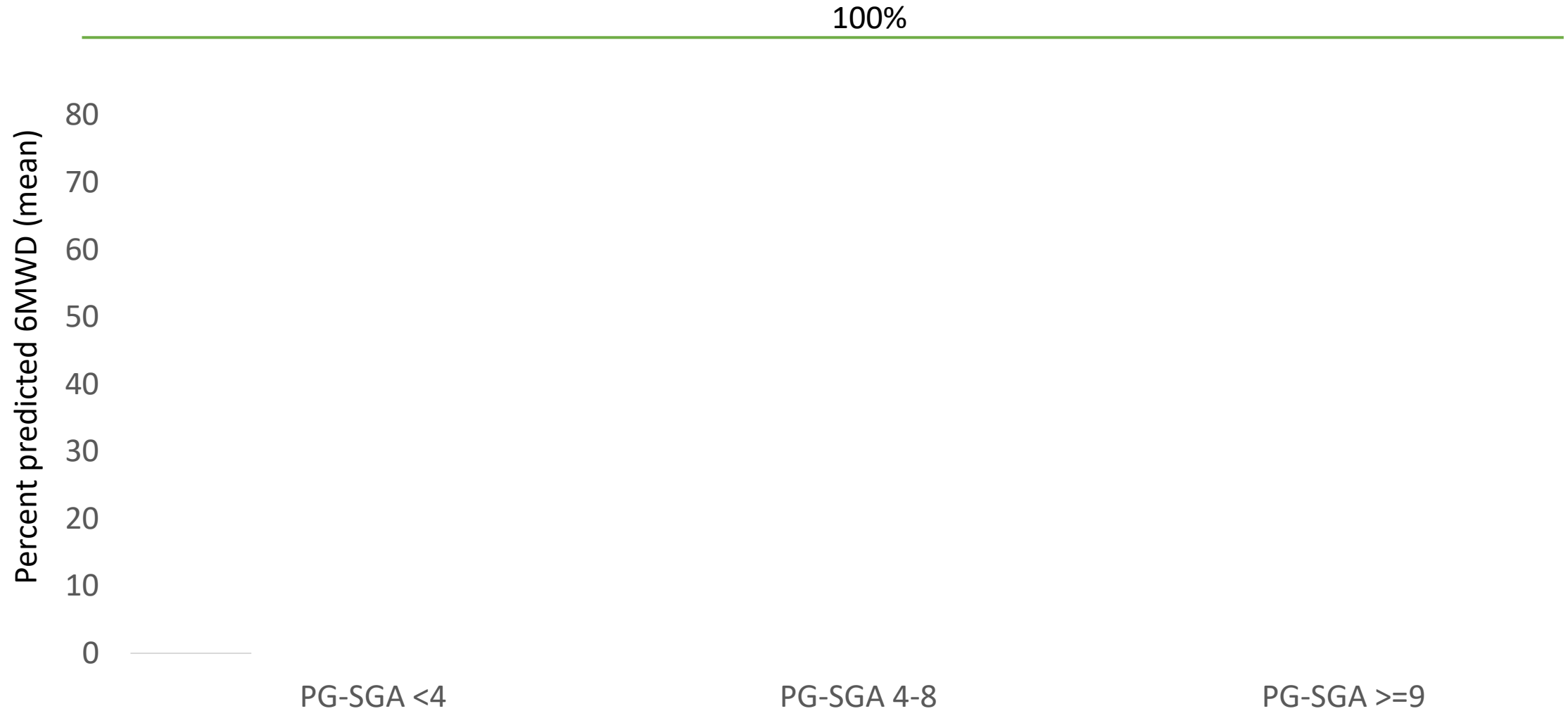
Phase of recovery	Definition	Time frame	Example measures
Pre-admission (proposed)	Preparation for postoperative recovery	Weeks to months	Adequate functional capacity to withstand surgical stress; resolution of malnutrition; sense of control and self-efficacy; prophylactic measures provided such as antibiotics and carbohydrate loading
Intraoperative	During the course of the surgical procedure	Hours	Fluid balance, pain and anaesthesia management
Postoperative			
Early	Until discharge from PACU	Hours	Vital signs
Intermediate	Until discharge from hospital	Days	Bowel recovery; length of hospital stay
Late	Until illness no longer disrupts everyday life	Weeks to months	Patient-reported resolution of symptoms; return to pre-surgery activities and functional capacity



PREHABILITATION: WHY BE CONCERNED ABOUT MALNUTRITION?

1. Nutrient deprivation incites adaptive mechanisms that *slow functioning* but delay body wasting.
2. Malnutrition is associated with a blunted inflammatory response to injury and immune incompetence.
3. Malnutrition is common and costly.

1. MALNUTRITION & DIMINISHED PHYSICAL FUNCTION

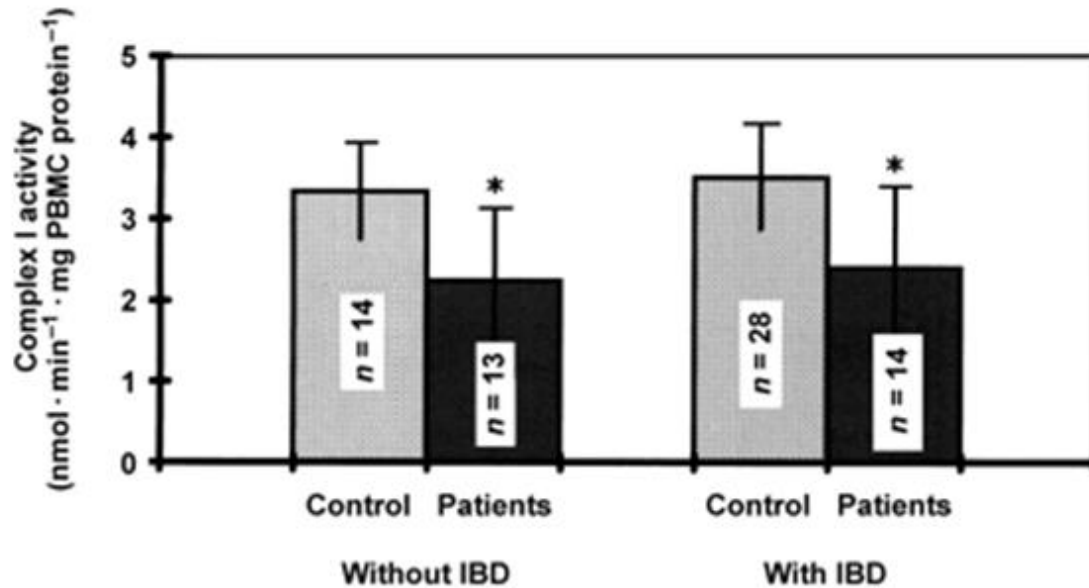


WHAT IS MALNUTRITION?

Malnutrition = An unbalanced nutritional state, resulting from poor food intake and/or disease, that alters body mass/composition and diminishes function.

2. MALNUTRITION & DIMINISHED IMMUNE FUNCTION

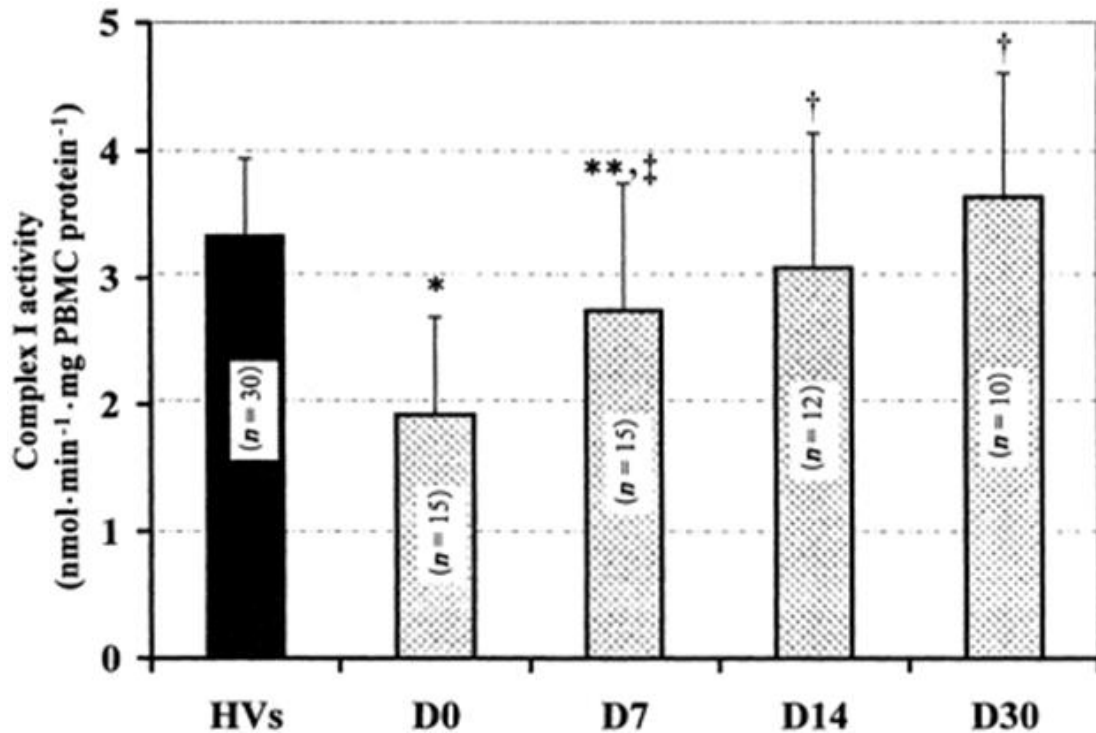
Mean (\pm SD) complex I activity of peripheral blood mononuclear cells (PBMCs) in malnourished patients with and without inflammatory bowel disease (IBD) and in the respective age-matched healthy control group



Finding: Mitochondrial complex I activity measured in peripheral blood mononuclear cells were lower in the malnourished subjects (independent of disease) as compared to the age-matched healthy controls.

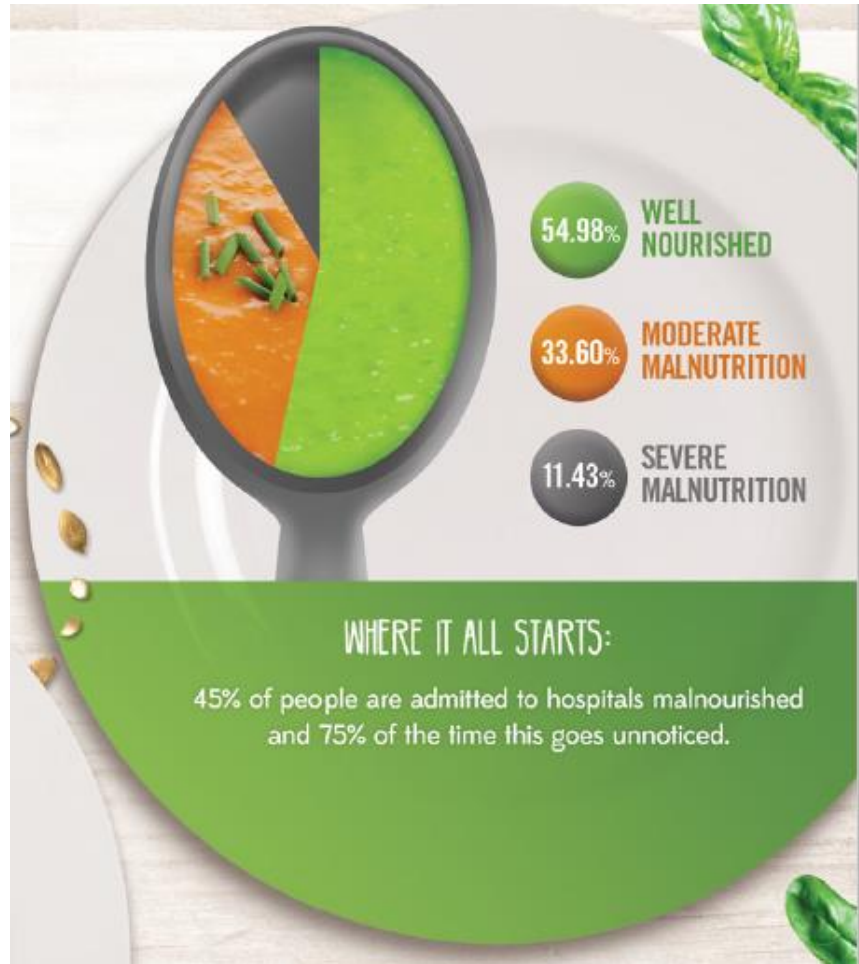
REFEEDING IMPROVES IMMUNE FUNCTION

Mean (\pm SD) complex I activity in peripheral blood mononuclear cells (PBMCs) in healthy volunteers (HVs) and in malnourished patients before (day 0; D0) and during (D7, D14, and D30) 1 mo of refeeding



Finding: Patients with malnutrition on day of hospital admission were provided nutritional support (enteral, parenteral, oral nutrition supplements); After one-week, the malnourished patients demonstrated increased complex I activity and complex activity returned to normal after 1 month of nutrition support

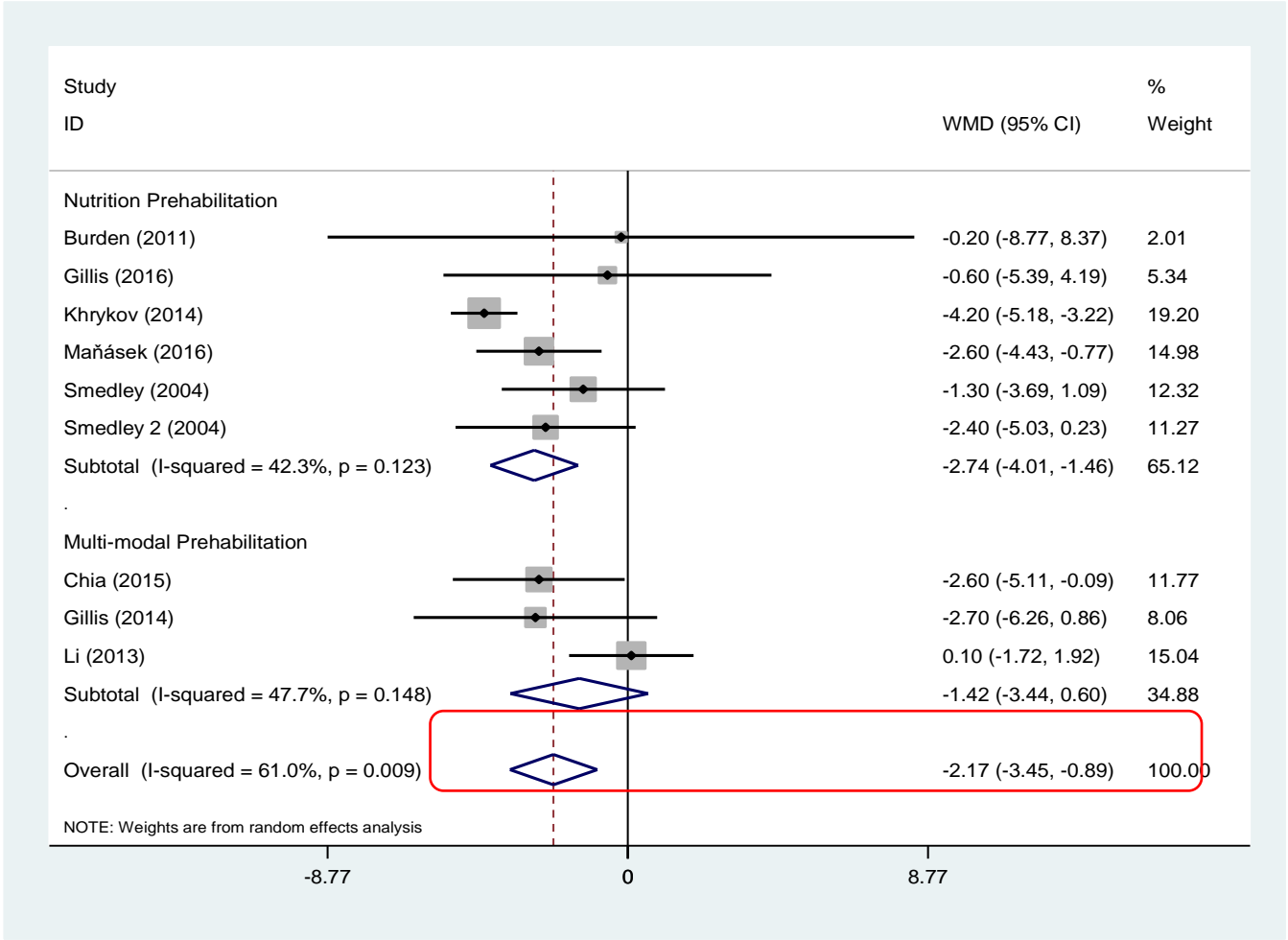
3. MALNUTRITION IS COMMON & COSTLY



NOT EATING YOUR MEDICINE IS COSTLY:
Malnutrition is a leading sign of a lengthy and costly hospital stay.

REFEEDING IMPROVES CLINICAL OUTCOMES

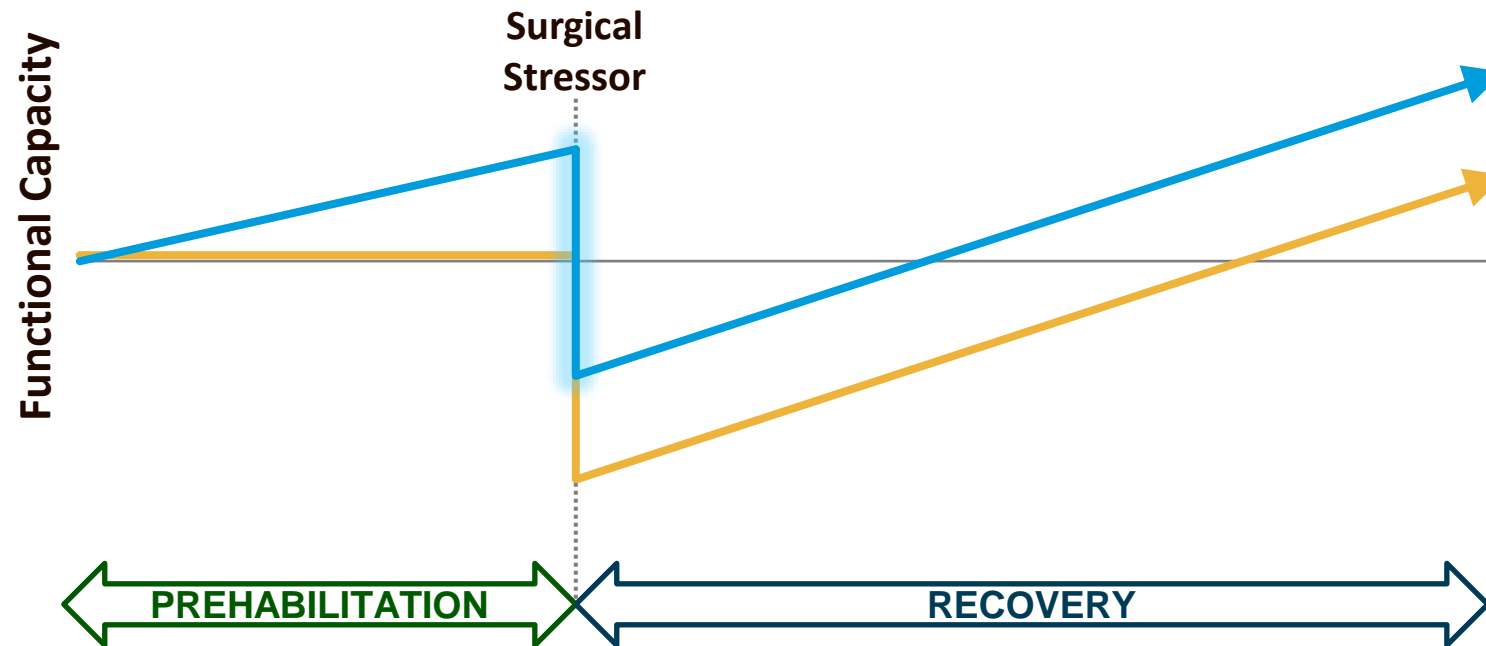
Nutrition prehabilitation for at least 7 days with or without exercise reduces length of hospital stay by 2 days post-colorectal surgery



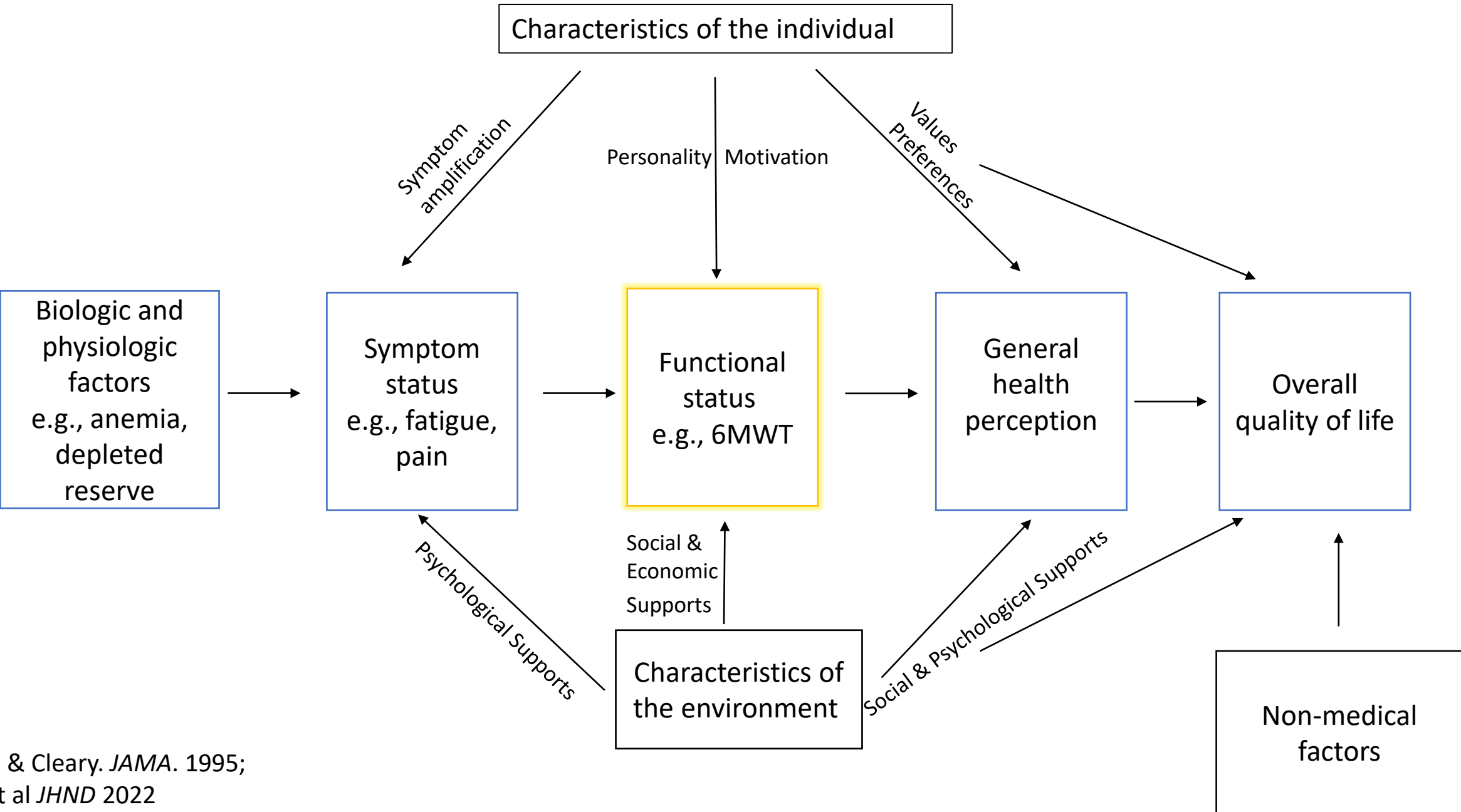
WHAT: PREHABILITATION

Prehabilitation:

An intervention designed to improve functional capacity in preparation for *an impending stressor*

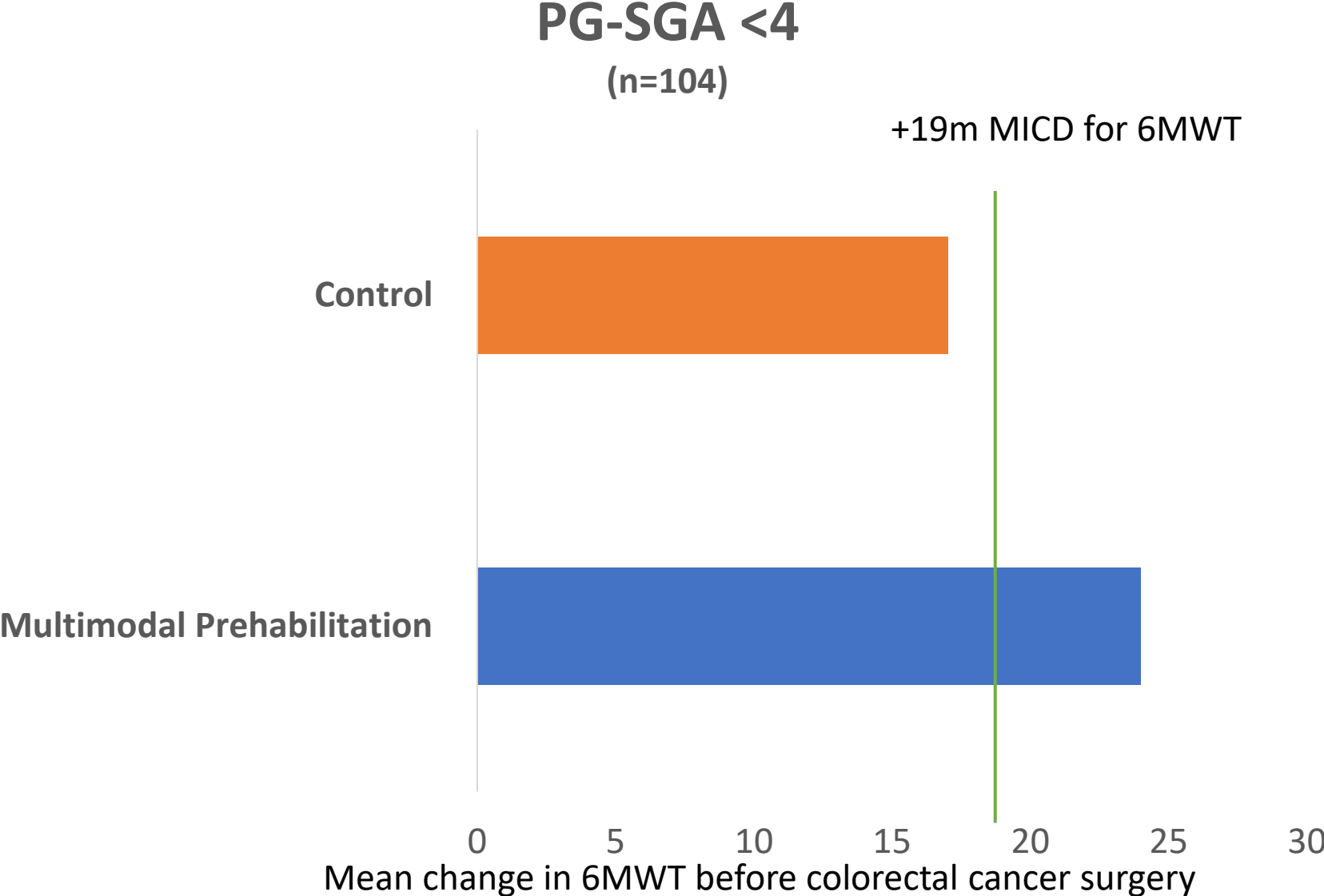


IF THE GOAL IS TO IMPROVE PREOPERATIVE FUNCTION...

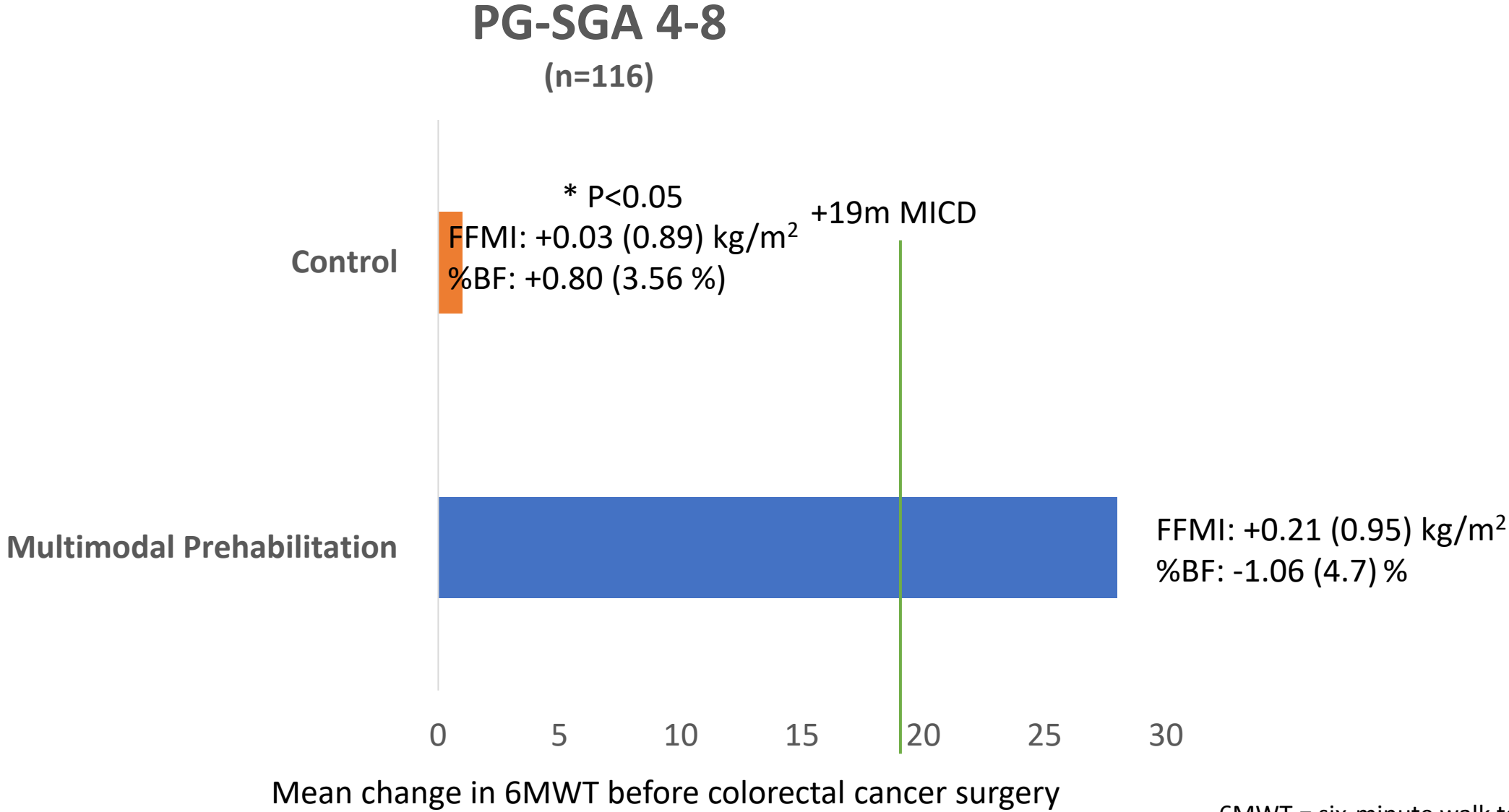


Wilson & Cleary. *JAMA*. 1995;
Gillis et al *JHND* 2022

MALNUTRITION MODIFIES FUNCTIONAL RESPONSE TO PREHABILITATION

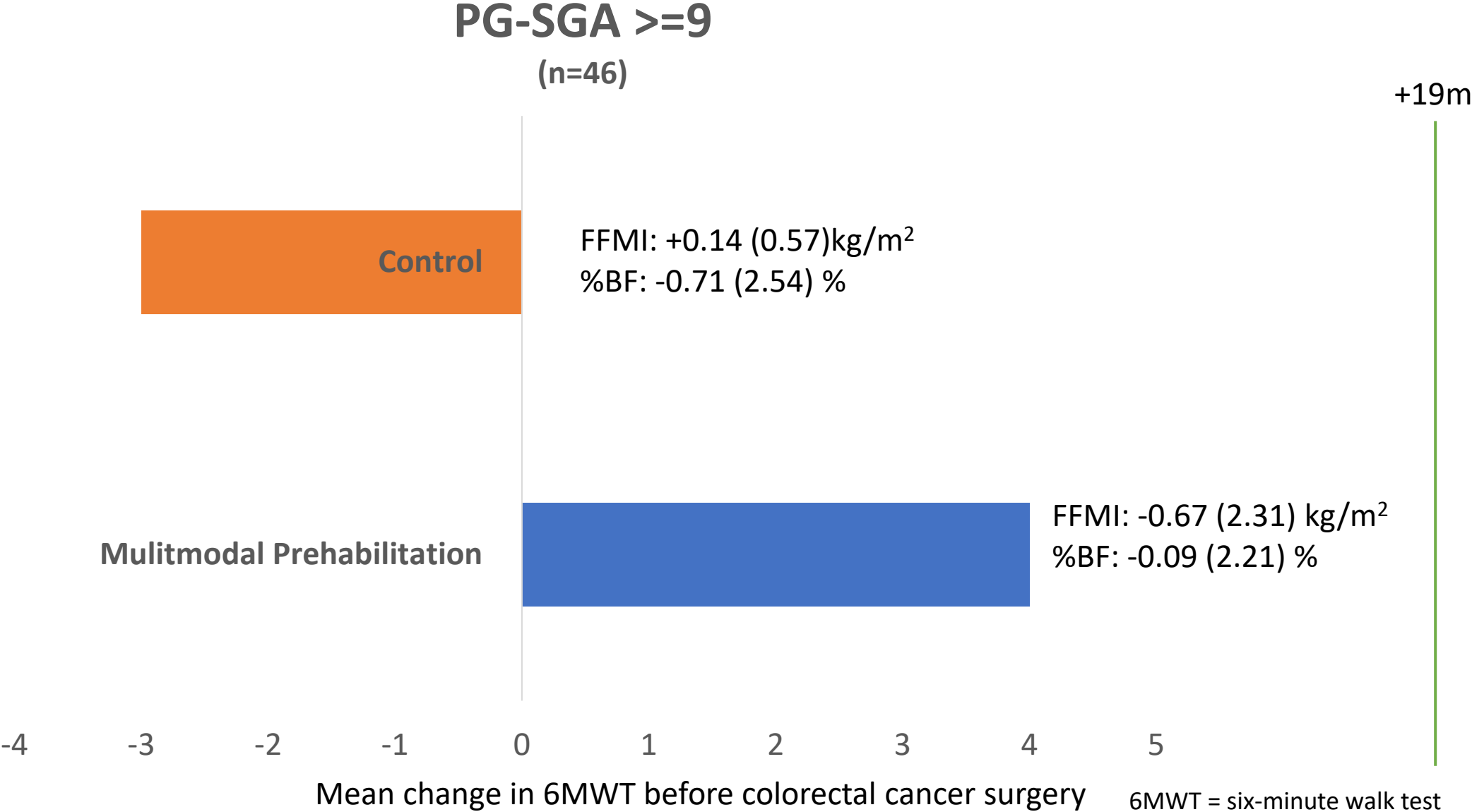


MALNUTRITION MODIFIES FUNCTIONAL RESPONSE TO PREHABILITATION



6MWT = six-minute walk test
FFMI= fat-free mass index
BF= body fat

MALNUTRITION MODIFIES FUNCTIONAL RESPONSE TO PREHABILITATION



NUTRITIONALLY PREPARE FOR SURGERY

The nutrition component of surgical programs should serve two basic purposes:

1. Avoid malnutrition

2. Support anabolism

1. Identify & Treat Malnutrition

SCREEN



Canadian Nutrition Screening
Tool (CNST)

ASSESS



Patient-Generated Subjective
Global Assessment (PG-SGA)

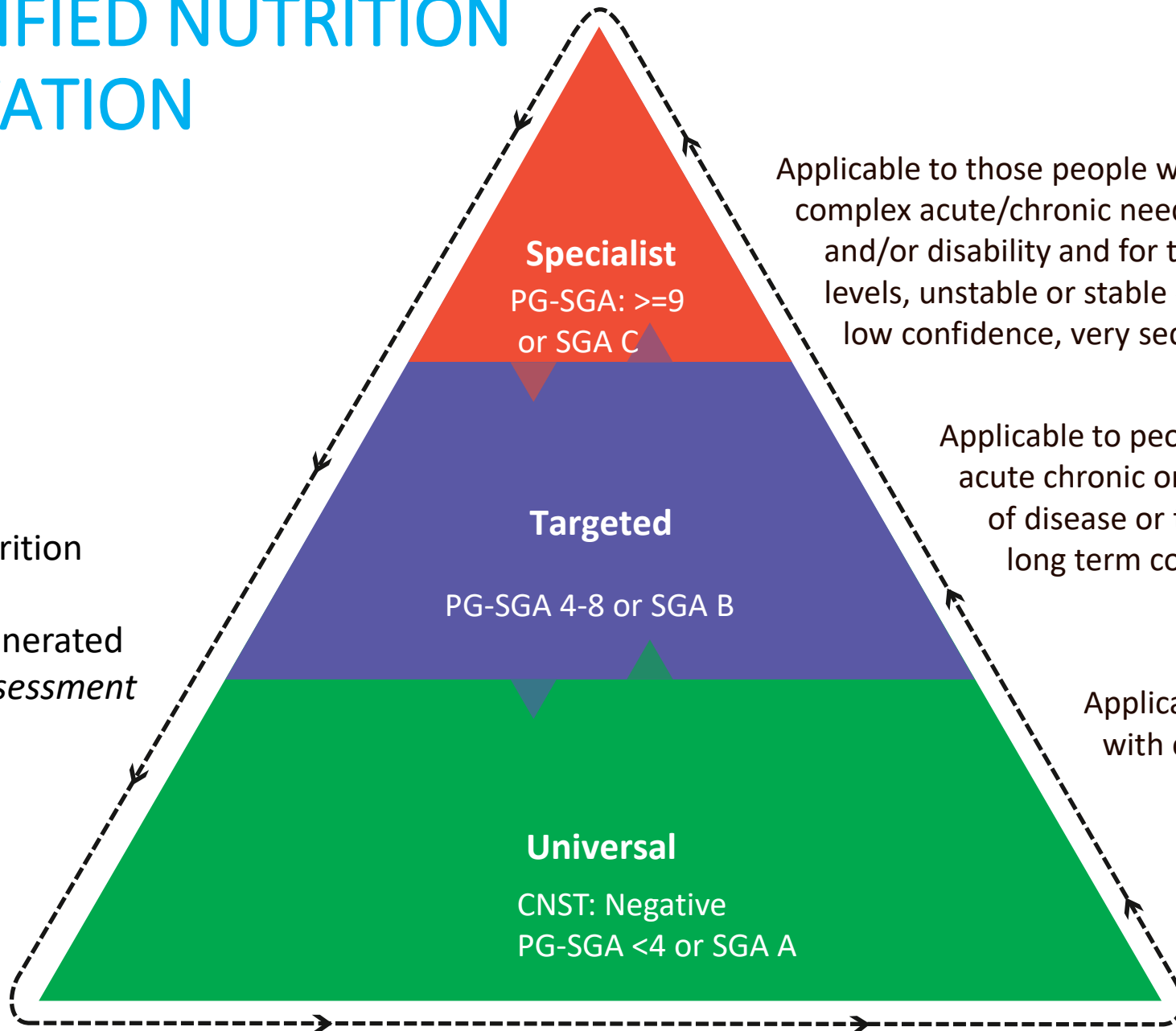
TREAT



Risk-stratified pyramid

RISK-STRATIFIED NUTRITION PREHABILITATION

CNST = Canadian Nutrition
Screening Tool
PG-SGA = Patient-Generated
Subjective Global Assessment



Applicable to those people with cancer who have complex acute/chronic needs, severe impairment and/or disability and for those with low functioning levels, unstable or stable cardiac/respiratory issues, low confidence, very sedentary

Applicable to people with a cancer with acute chronic or latent adverse effects of disease or treatment and/or other long term conditions

Applicable to anyone with cancer

RISK-STRATIFIED NUTRITION PREHABILITATION

- **UNIVERSAL:**

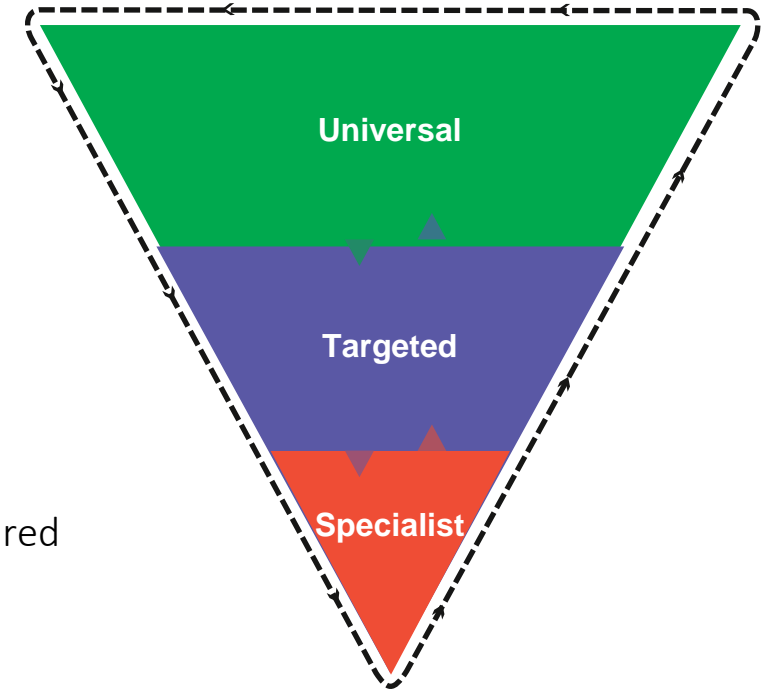
- Class and handouts

- **TARGETED:**

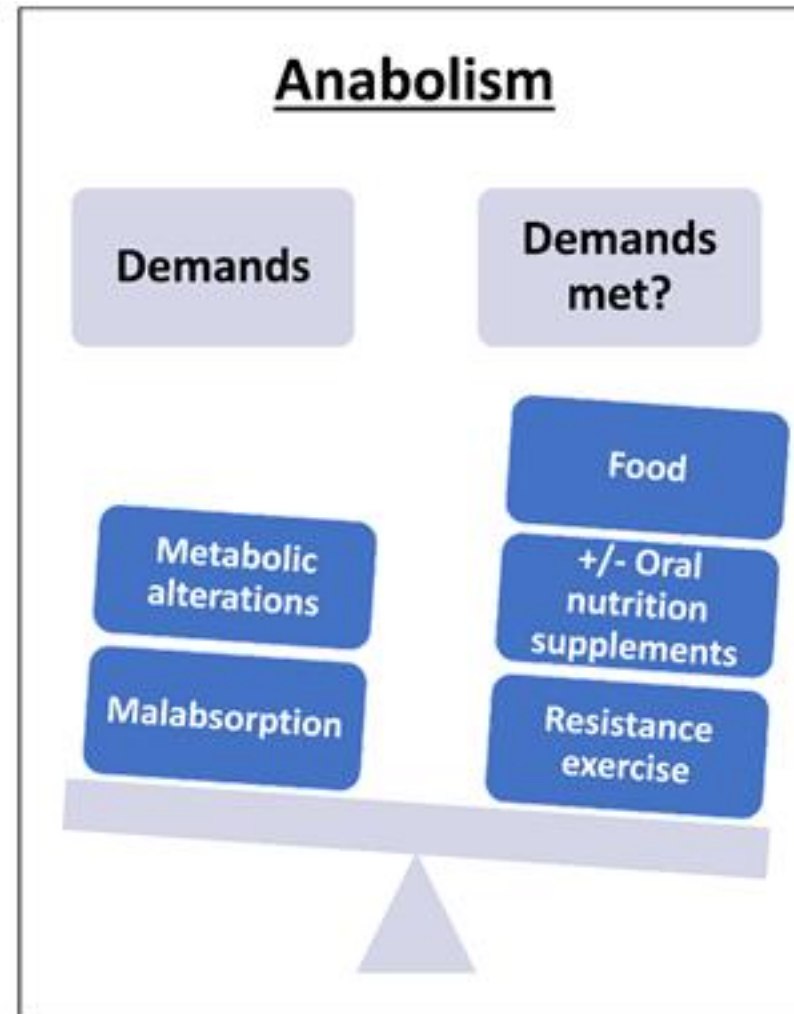
- Nutrition-symptom management
- Follow-up within 7-10 days by telephone or online platform

- **SPECIALIST:**

- Energy and protein supplements to meet usual deficit
 - Start with oral nutrition supplements, but enteral/parenteral may be required
- Multivitamin/mineral supplement
- Support energy cost of exercise with additional kcal
- Follow-up within 7 days by telephone or online platform, in person visit within 4 weeks



2. Support Protein Anabolism



WHAT IS THE CURRENT STATE OF PREHABILITATION LITERATURE?

In the prehabilitation oncology literature, how often is nutrition...

Screening or assessment done? **30% of the time; 15% used a validated tool**

Interventions based on evidence? **25% of the time...**

Monitoring/evaluation? **25% of the time...**

KEY POINTS

- Malnutrition influences function.
- Nutrition interventions are an integral component of prehabilitation.
- Majority of prehabilitation work in oncology does not consider nutritional status of patients.
- Evidence that risk stratified care is effective to prepare well-nourished patients and to treat moderately malnourished patients.

THANK YOU!

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