

# Impact of pre-operative nutrition status and metabolic equivalent of task on clinical outcomes in head and neck free flap reconstruction



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## Introduction

- Preoperative functional status tools including metabolic equivalent of task (MET) and Charleston Comorbidity Index (CCI) can play a significant role anticipating surgical recovery<sup>1</sup>
- Head and neck cancer or trauma patients who require free flap reconstruction often have complex health histories which may contribute to prolonged healing and complications<sup>2</sup>
- Ongoing research can help identify at-risk patients for complications to facilitate comprehensive pre-op counseling

Metabolic Equivalent of Task (MET) Score

MET	Activity
1	reading, watching television
	eating, getting dressed
2–3	walking on level ground at 3–4 km/h
	light housework
4	climbing a few stairs
	walking on level ground at ca. 6 km/h
	running (short distances)
	heavy household chores
	moderately strenuous sports (golf, dancing)
>10	highly strenous sports (tennis, soccer)

Charleston Comorbidity Index (CCI)

Comorbidity	Score
Prior myocardial infarction	1
Congestive heart failure	1
Peripheral vascular disease	1
Cerebrovascular disease	1
Dementia	1
Chronic pulmonary disease	1
Rheumatologic disease	1
Peptic ulcer disease	1
Mild liver disease	1
Diabetes	1
Cerebrovascular (hemiplegia) event	2
Moderate-to-severe renal disease	2
Diabetes with chronic complications	2
Cancer without metastases	2
Leukemia	2
Lymphoma	2
Moderate or severe liver disease	3
Metastatic solid tumor	6
Acquired immuno-deficiency syndrome (AIDS)	6

## Objective

- To determine if pre-operative nutritional status (BMI, albumin, TSH) or functional status (MET, CCI) had any prognostic value in post-operative complications or length of stay

## Methods

- Retrospective chart review of 266 patients 18+ years old who underwent parascapular or scapular free flap reconstruction for head and neck cancer or trauma defects at Atrium Health Wake Forest Baptist from 2011-2021

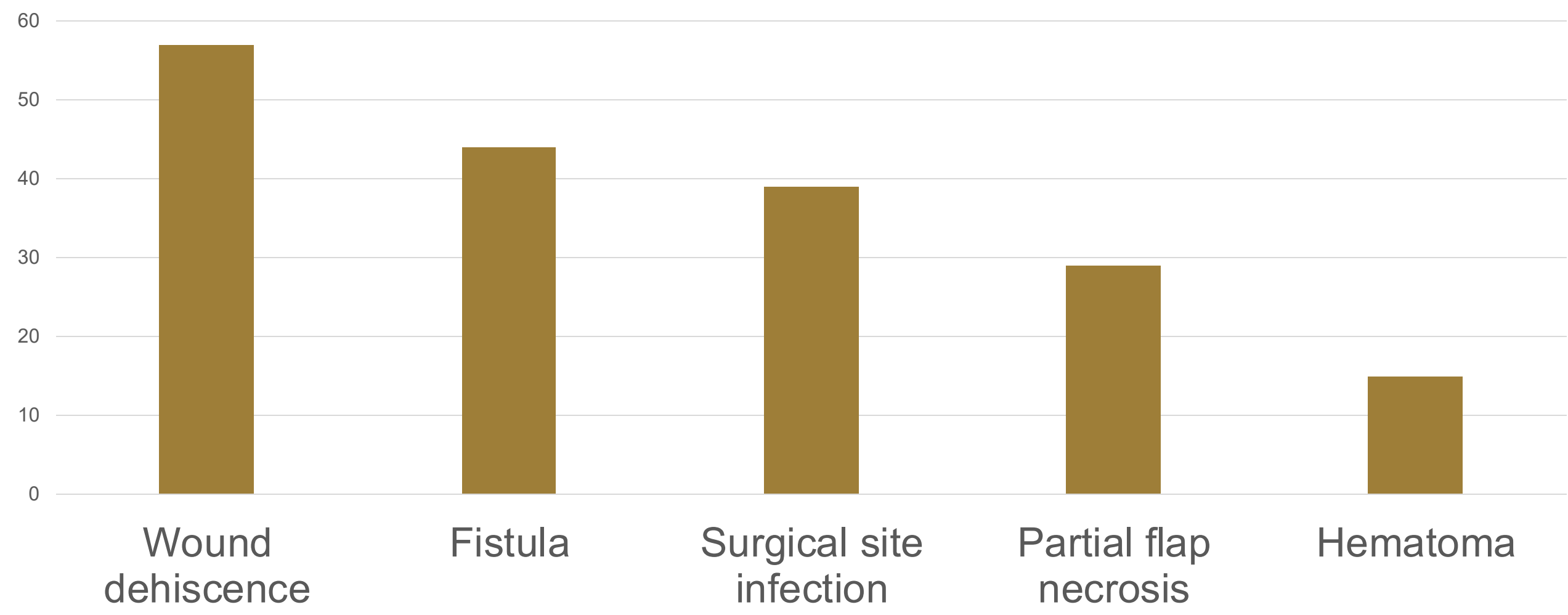
Table 1: Demographics.

		Number (%)
Sex	Male	173 (65%)
	Female	93 (35%)
Average age (years)		64
Indication	Head and neck cancer	248 (93%)
	Trauma	5 (2%)
Type of flap reconstruction	Parascapular	184 (69%)
	Scapular	81 (31%)
Length of stay (days)		10.9

Table 2: Perioperative nutritional markers and functional status.

		Number (%)
Body Mass Index	Underweight (<18.5)	27 (11%)
	Normal (18.5-24.5)	118 (46%)
	Overweight (24.5-29.9)	72 (28%)
	Obese (>30)	32 (12.5%)
Perioperative albumin	Low	48/179 (27%)
	Normal	130/179 (73%)
Perioperative TSH	Normal	67/142 (47%)
	High	71/142 (50%)
Metabolic Equivalent of Task (MET) Score	Poor (<4)	56 (33%)
	Moderate (4-6)	56 (33%)
	Good (7-10)	57 (34%)
	Excellent (>10)	1 (1%)
Charleston Comorbidity Index (CCI)	None (0)	4 (2%)
	Mild (1-2)	29 (11%)
	Moderate (3-4)	64 (25%)
	Severe (5+)	158 (62%)

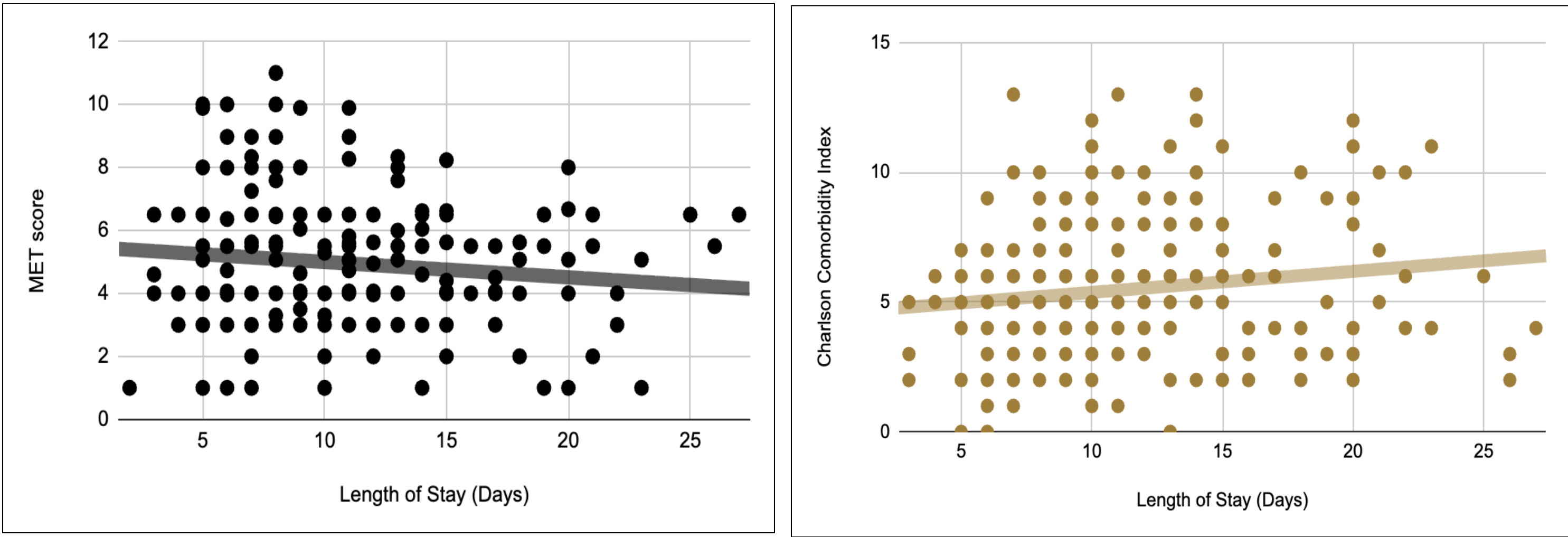
Figure 1: Post-operative complications.



## Results

- Pre-operative nutritional status as measured through BMI, albumin, and TSH did not have a significant influence on post-operative complications or length of stay
- Functional markers including MET score and CCI were associated with statistically significant difference in length of stay (p<0.05)

Figure 2/3: MET score and CCI versus length of stay.



## Conclusions

- Pre-operative functional markers may have higher predictive value for post-operative length of stay for free flap patients than nutritional status
- Pre-operative interview should aim to identify a patient's current functional status and emphasize importance of optimization prior to undergoing major reconstructive surgery

Citations  
1. Silvapulle E, Darvall J. Subjective methods for preoperative assessment of functional capacity. BJA Educ. 2022 Jul;22(7):249-257. doi: 10.1016/j.bjae.2022.02.007. Epub 2022 May 25. PMID: 35754857; PMCID: PMC9214434.  
2. Urs Müller-Richter, C. Betz, S. Hartmann, R.C. Brands, Nutrition management for head and neck cancer patients improves clinical outcome and survival, Nutrition Research, Volume 48, 2017, Pages 1-8, ISSN 0271-5317, <https://doi.org/10.1016/j.nutres.2017.08.007>.

Odds ratios and 95% confidence intervals were calculated to assess the strength of this relationship; p-values < 0.05 were assumed to be statistically significant. SAS (version 9.4, Cary, NC, USA) was used for all analyses.