

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 recovery¹
- Head and neck cancer or trauma patients who require free flap reconstruction often have complex health histories which may contribute to prolonged healing and complications²
- 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 strenuous 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

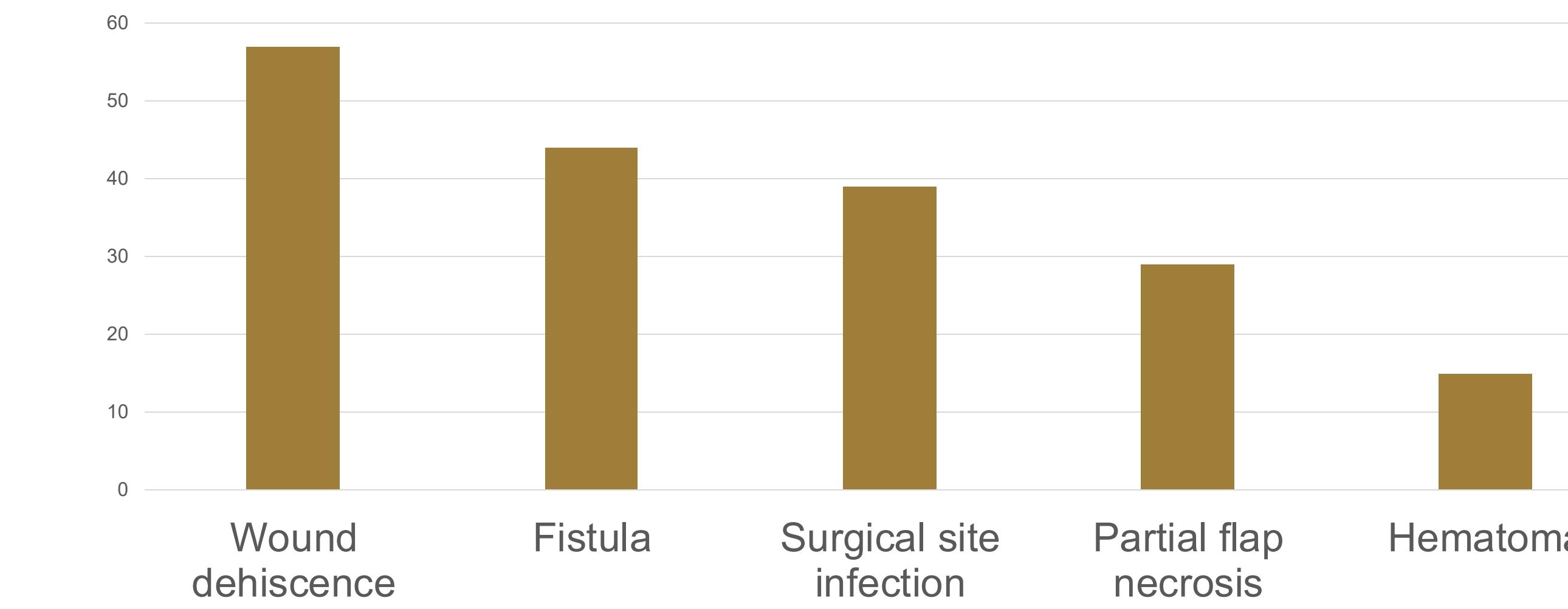
Table 1: Demographics.

		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%)

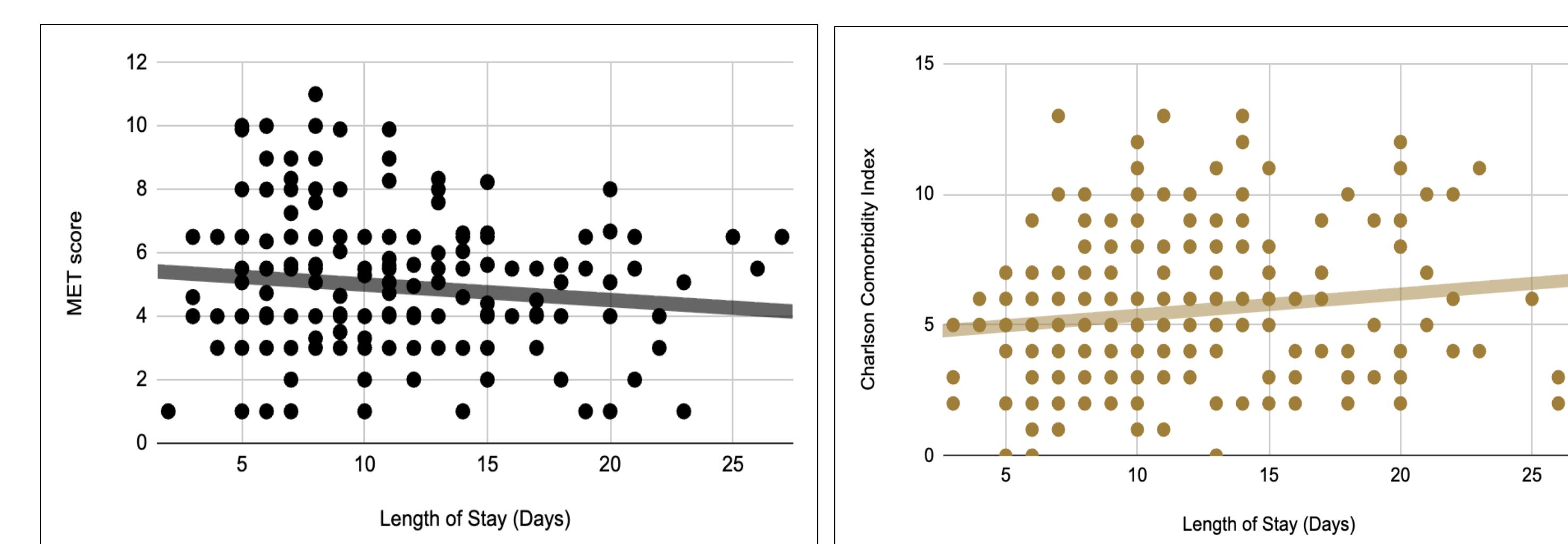
Figure 1: Post-operative complications.



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

- 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.
- 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.