Prehabilitation is the optimization of physical, physiological, mental, and nutritional status in malnourished and physically dependent patients with the goal of improving surgical outcomes and decreasing morbidity and mortality. The methods for assessing the presence and severity of preoperative predictive factors have been researched, however, a need exists for more information regarding a relationship between functional strength and laboratory values with scores of frailty and malnutrition. With better understanding of the relationships between predictive markers of a cancer patient's preoperative status, it may be possible to develop more sensitive tools to determine which patients are likely to benefit from prehabilitation even prior to disability.

A retrospective review of 105 cancer patients planning for operative resection enrolled in a preoperative prehabilitation program at a tertiary level referral institution was conducted. Comparison of each Hand Grip Strength right, Hand Grip Strength left, Timed Up and Go (TUG), and Frailty Index with:

- Hemoglobin
- White blood cell count
- Platelets
- Albumin
- Prealbumin
- Hemoglobin A1c
- C-reactive protein (CRP)
- BMI
- Tobacco pack years
- American Society of Anesthesiology Score (ASA)
- Eastern Cooperative Oncology Group (ECOG)
- Performance Score
- Charlson Comorbidity Index (CCI)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Grip Strength R</th>
<th>p value</th>
<th>Grip Strength L</th>
<th>p value</th>
<th>Frailty</th>
<th>p value</th>
<th>TUG</th>
<th>p value</th>
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</thead>
<tbody>
<tr>
<td>Hgb</td>
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<td>&lt;0.001</td>
<td>0.332</td>
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<td>-0.497</td>
<td>0.001</td>
<td>-0.076</td>
<td>0.591</td>
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<td>ECOG</td>
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<td>0.002</td>
<td>-0.361</td>
<td>0.007</td>
<td>0.418</td>
<td>0.01</td>
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<td>0.02</td>
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</table>

ECOG demonstrated a positive correlation with each measure of physical strength and negative correlation with frailty index. Of measured laboratory values, hemoglobin demonstrated a positive relationship with each measure of physical strength and negative relationship with frailty index. There was no significant relationship present between values of platelets, albumin, prealbumin, HgbA1c, CRP, BMI, tobacco use history, ASA or CCMi.

The results of this study implicate that there is no single laboratory value derangement, aside from existing anemia, that determines preoperative status for enrollment of patients in a prehabilitation program. ECOG score was shown to align with frailty and physical strength, but the significance of its use for determining involvement in a prehabilitation program is not clear. The relationship between each of these measures could be useful as measures of patient progress through prehabilitation. There are also more questions regarding if specific goals for physical and/or laboratory measures can be set prior to proceeding with surgery. The hope is that more tools can be developed to identify patients to enroll in prehabilitation that may have not otherwise been identified as a candidate. More research is needed about the biomarkers that encompass the clinical picture of malnutrition and physical function of preoperative cancer patients.

References