

# The Functional Assessment of Anorexia/Cachexia Therapy (FAACT) Appetite Scale in Veteran Cancer Patients

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Lack of appetite is a major concern for cancer patients and their families<sup>1,2</sup>; it also has been associated with imminent death in the elderly.<sup>3</sup> The pathophysiology of anorexia in humans, one of the most commonly experienced symptoms associated with cancer, is poorly understood; however, interest in trials of appetite stimulants remains high.<sup>4,5</sup>

The measurement of appetite in cancer patients was stimulated by trials of megestrol and by development of the Bristol-Myers Anorexia/Cachexia Recovery Instrument and the North Central Cancer Treatment Group (NCCTG) scales.<sup>6,7</sup> These instruments relied upon patient reports of change in food intake and weight to measure factors related to appetite. Other patient-rated assessments of appetite have been developed, including the Functional Assessment of Anorexia/Cachexia Therapy (FAACT), which attempts to capture information on quality-of-life aspects of anorexia and single-item patient ratings of appetite.

The goal of this project was to correlate these patient ratings with quality of life, symptom status, other measures of appetite, routine laboratory values, and survival in patients being treated for cancer.

## Materials and Methods

From January 1997 to August 1998, 180 consecutive patients followed by the Veterans Administration New Jersey Hematology/Oncology Section completed the Functional Assessment of Cancer Therapy-General (FACT-G), the FAACT, the Memorial Symptom Assessment Scale Short Form (MSAS-SF), and the Zung Self-Rating Depression Scale (Zung); in addition,

**Abstract** Anorexia and appetite assessment is an important priority in supportive oncology. A series of 156 veterans participating in a hematology oncology service completed the Functional Assessment of Anorexia/Cachexia Therapy (FAACT), the Functional Assessment of Cancer Therapy-General scale, the Memorial Symptom Assessment Scale Short Form (MSAS-SF), and the Zung Self-Rating Depression Scale and were followed for survival. The FAACT score correlated well with Karnofsky performance status, quality of life, and symptom distress subscales. A single appetite distress item from the MSAS-SF correlated well with these measures. Both appetite measures correlated with the presence of other symptoms and with concurrently measured hemoglobin, serum sodium, albumin, and cholesterol levels. These self-reported appetite measures were univariate predictors of survival and contributed additional prognostic information to data related to weight-loss distress. In a smaller study, the FAACT score correlated with a visual analogue measure of appetite and with the North Center Cancer Treatment Group appetite instrument. These data support use of these tools for the evaluation of appetite concerns among patients with advanced cancer.

tion, clinical investigators collected demographic data (Karnofsky performance status [KPS], age, primary cancer site, extent of disease, recent cancer therapy, routine serum blood determinations) in an investigational review board (IRB)-approved protocol. In all, 158 patients had locally advanced or metastatic cancer, and 156 patients completed the FAACT. That cohort forms the population for study 1.

Using different instruments, 26 medically stable inpatients completed the FAACT, NCCTG instrument (7 items), and a vertical visual analogue scale (VAS) appetite instrument.<sup>8</sup> Demographic data were collected concurrently. This was an IRB-approved protocol, and patients gave informed consent. The goal of the second study was to measure correlations of the FAACT scores with other measures of appetite.

## INSTRUMENTS USED

*Study 1.* The FACT-G (version 3) is a validated,

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**Table 1**

**Correlation of Appetite Measures With Demographic Characteristics**

DEMOGRAPHIC	FAACT		LACK OF APPETITE (MSAS-SF)	
	r	P	r	P
KPS	0.61	< 0.0001	-0.45	< 0.0001
Zung depression (raw)	-0.60	< 0.0001	0.50	< 0.0001
Using narcotics	-0.48	< 0.0001	0.37	< 0.0001
Weight	0.29	< 0.0006	-0.32	< 0.0002
Body mass index	0.23	< 0.01	-0.25	< 0.008
Stage of disease	-0.20	< 0.01	0.18	0.03
Chemotherapy	0.19	0.02	-0.11	0.16
Radiotherapy	-0.15	0.06	0.13	0.12
Radio-/chemotherapy	-0.1	0.21	-0.02	0.76
Opioid dose	-0.06	0.47	0.03	0.67
Age	0.04	0.60	0.008	0.92
Caregiver at home	0.03	0.74	0.003	0.98

Abbreviations:FAACT = Functional Assessment of Anorexia/Cachexia Therapy;KPS = Karnofsky performance status;MSAS-SF = Memorial Symptom Assessment Scale Short Form

28-item, general, patient-rated measure of quality of life for cancer patients with any tumor type. Participants score each item from 0 (“not at all”) to 4 (“very much”). This tool has five subscales: functional well-being (7 items), physical well-being (7 items), social/family well-being (7 items), relationship with physician (2 items), and emotional well-being (5 items); the total quality-of-life score ranges from 0–112.<sup>9</sup> Higher scores imply better quality of life.

The FAACT is an 18-item measure of patients’ perceptions of appetite in which participants score items from 0 (worst response) to 4 (best response). The maximum (best) score is 72.<sup>10</sup>

The MSAS-SF is a patient-rated instrument with which patients rate symptom distress associated with 28 physical symptoms and the frequency of 4 psychological symptoms that may have occurred over the previous 7 days. Each symptom is scored from 0 (“no symptom”) to 4 (“very much”). Distress from lack of appetite and distress from weight loss are two of the items in this instrument. Validated subscales include a physical symptom subscale, a psychological symptom subscale, a Global Distress Index, and the number of symptoms present.<sup>11</sup> Again, higher values are associated with increased distress.

The Zung scale is a validated instrument for assessing depression. Patients answer 20 questions with a numeric scale of 0–4, with the maximum possible raw score being 80. The depression indices were derived by dividing the sum of the raw scores on the 20 items by 80 and expressing the result as a decimal. The mean values for normal control subjects and depressed patients have been established.<sup>12</sup>

Patients in this first study were followed for survival.

*Study 2.* The NCCTG appetite instrument has seven patient-rated items. The sum of the answers to these seven questions was used as the NCCTG appetite score. This instrument has been used extensively in appetite studies.<sup>7</sup> The VAS is an-

**Table 2**

**Correlation of Appetite Measures With Quality-of-Life and Symptom Measures**

MEASURE	FAACT		LACK OF APPETITE (MSAS-SF)	
	r	P	r	P
<b>FACT-G</b>				
Physical well-being	0.68	< 0.0001	-0.58	< 0.0001
Emotional well-being	0.32	< 0.001	-0.27	< 0.001
Social family well-being	0.078	0.34	-0.006	0.94
Functional well-being	0.43	< 0.0001	-0.37	< 0.0001
Total quality of life	0.53	< 0.0001	-0.45	< 0.0001
<b>MSAS-SF</b>				
Number of symptoms	-0.70	< 0.0001	0.51	< 0.0001
Global Distress Index*	-0.71	< 0.0001	0.60	< 0.0001
Global Distress Index (original)	-0.64	< 0.0001	0.47	< 0.0001
Physical distress*	-0.79	< 0.0001	0.69	< 0.0001
Physical distress (original)	-0.76	< 0.0001	0.61	< 0.0001
Psychological distress	-0.36	< 0.0001	0.24	0.003
KPS	0.61	< 0.0001	-0.46	< 0.0001

\* Lack of appetite removed from the summary distress subscale

Abbreviations: FAACT = Functional Assessment of Anorexia/Cachexia Therapy; MSAS-SF = Memorial Symptom Assessment Scale Short Form; FACT-G = Functional Assessment of Cancer Therapy-General; KPS = Karnofsky performance status;

chored with “No food intake” at the bottom and with “Maximal food intake possible” at the top.<sup>8</sup>

**STATISTICAL ANALYSES**

Pearson correlation analyses were performed between FAACT scores and potential explanatory variables, such as specific symptoms in the MSAS-SF and laboratory values. Ordinal regression was performed to determine whether a similar relationship could be found between responses to the MSAS-SF appetite item and other symptoms and laboratory values. Survival was determined from either the date of study registration to date of death or censored at December 15, 2004, if the patient was alive on that day.

Kaplan-Meier survival curves were calculated, and the log rank test was applied to determine if the survival curves were different. Cox regression survival models were developed to study whether lack of appetite scores was a predictor of survival. Analyses were performed with SAS version 8.0.

**Results**

**DEMOGRAPHICS**

*Study 1.* The median age was 68 years (range, 39–85 years), KPS was 80% (range, 20%–100%), weight was 165 pounds (range, 87–314 pounds), and body mass index (BMI) was 25.3 (range, 14.1–41.6). In all, 76 patients (49%) were on opioids, using a morphine median equivalent daily dose of 60 mg (range, 10–3,840 mg). Primary types of cancer were prostate (54 patients, 35%), lung (38 patients, 24%), colorectal (25

**Table 3****Correlation of Appetite Measures With Routine Laboratory Values**

LABORATORY TEST	FAACT		LACK OF APPETITE (MSAS-SF)	
	r	P	r	P
Sodium	0.25	< 0.001	-0.21	< 0.009
Albumin	0.29	< 0.0003	-0.27	< 0.0006
Cholesterol	0.31	< 0.0001	-0.23	< 0.005
Hemoglobin	0.20	< 0.01	-0.21	< 0.005
WBC	-0.09	0.25	0.006	0.94
Potassium	0.07	0.36	-0.03	0.71
Protein	0.08	0.32	-0.16	0.06
LDH	-0.04	0.66	0.05	0.51
Bilirubin	-0.14	0.09	0.13	0.11
BUN	-0.05	0.54	0.02	0.82
Creatinine	-0.01	0.88	0.10	0.22

Abbreviations: FAACT = Functional Assessment of Anorexia/Cachexia Therapy; MSAS-SF = Memorial Symptom Assessment Scale Short Form; WBC = white blood cell; LDH = lactate dehydrogenase; BUN = blood urea nitrogen

patients, 15%), lymphoma (14 patients, 9%), head and neck (8 patients, 5%), and other cancer types (17 patients, 12%). Extent of disease was locally advanced in 37 patients (24%) and metastatic in 119 patients (76%). Further, 71 patients (46%) were inpatients, and 85 patients (54%) were outpatients. Within the 2 months prior to participating in the study, 30 patients (19%) had received chemotherapy, 18 patients (11%) had received radiotherapy, and seven patients (4.5%) had received both.

**Study 2.** The median age was 66 years (range, 43–84 years); primary sites were genitourinary in 9 patients, gastrointestinal in 5 patients, and other in 12 patients. The large majority (22 patients) had metastatic disease.

**DATA ON VARIOUS TESTS**

**Study 1.** The mean FAACT score was 52 (13.4 SD). On the FACT-G, the score for the mean physical well-being subscale was 20.9 (5.7 SD), for the mean emotional well-being subscale was 16.4 (4.3 SD), for the mean social family well-being subscale was 16.4 (3.7 SD), for the mean functional well-being subscale was 15.9 (7.4 SD), and for the mean sum quality of life was 76.6 (15.8 SD). For the MSAS-SF subscales, the mean value for physical symptom distress was 0.91 (0.76 SD), for psychological distress was 0.73 (0.82 SD), for the Global Distress Index was 1.01 (0.79 SD), and for the number of symptoms was 10 (5.9 SD). The mean Zung score was 39 (11 SD).

Both appetite scores correlated with the Zung rating scale and demographic measures such as the KPS, body mass index, weight, extent of disease, the use of opioids, and possibly recent chemotherapy; no correlation was found with radiation therapy, opioid dose, age, or the presence of a caregiver (Table 1).

FAACT scores correlated with FACT physical well-being, functional well-being, and emotional well-being quality-of-life subscales and with the KPS. FAACT scores also correlated

**Table 4****Correlation of Appetite Levels With Ratings of Other Symptoms (MSAS-SF)**

SYMPTOM	n (%)	FAACT		LACK OF APPETITE (MSAS-SF)	
		r	P	r	P
Lack of energy	108 (70%)	-0.67	< 0.0001	0.47	< 0.0001
Pain	102 (66%)	-0.47	< 0.0001	0.36	< 0.0001
Dry mouth	83 (54%)	-0.50	< 0.0001	0.37	< 0.0001
Dyspnea	75 (48%)	-0.51	< 0.0001	0.41	< 0.0001
Weight loss	73 (47%)	-0.65	< 0.0001	0.55	< 0.0001
Drowsiness	72 (46%)	-0.54	< 0.0001	0.50	< 0.0001
Cough	66 (43%)	-0.28	< 0.0005	0.13	0.10
Lack of appetite	60 (39%)	-0.76	< 0.0001	1.00	1.0
Difficulty sleeping	57 (37%)	-0.29	< 0.0003	0.27	0.0006
Worrying	54 (35%)	-0.33	< 0.0001	0.20	< 0.01
Constipation	55 (35%)	-0.31	< 0.0001	0.26	< 0.001

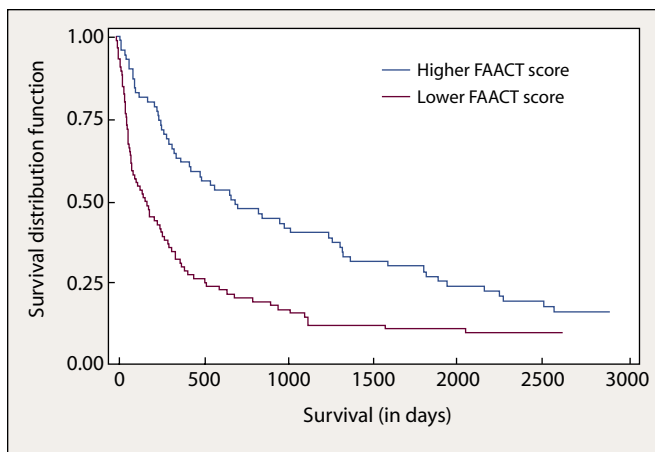
Abbreviations: FAACT = Functional Assessment of Anorexia/Cachexia Therapy; MSAS-SF = Memorial Symptom Assessment Scale Short Form

**Table 5****Relative Risk of Symptoms With Lack of Appetite (MSAS-SF)**

SYMPTOM	RELATIVE RISK	95% CI	P
Lack of energy	4.32	(1.95–9.54)	< 0.0001
Weight loss	3.14	(1.95–5.06)	< 0.00001
Feeling drowsy	2.52	(1.65–3.84)	< 0.00001
Pain	2.41	(1.35–4.31)	< 0.001
Shortness of breath	2.09	(1.40–3.11)	< 0.0001
Dry mouth	1.96	(1.28–2.99)	< 0.0006
Changes food taste	1.72	(1.31–2.25)	< 0.0001
Constipation	1.53	(1.16–2.02)	< 0.001
Difficulty sleeping	1.47	(1.08–1.90)	0.007
Nausea	1.39	(1.14–1.72)	< 0.0002
Worrying	1.33	(1.00–1.69)	0.035
Feeling irritable	1.31	(1.05–1.64)	0.008
Self-image	1.29	(1.05–1.51)	0.004
Problems with sex	1.28	(1.01–1.62)	< 0.03
Feeling sad	1.27	(1.02–1.60)	0.019
Difficulty swallowing	1.27	(1.09–1.50)	0.0004
Feeling bloated	1.26	(1.04–1.54)	0.011
Vomiting	1.24	(1.08–1.44)	0.003
Diarrhea	1.19	(1.00–1.36)	0.032

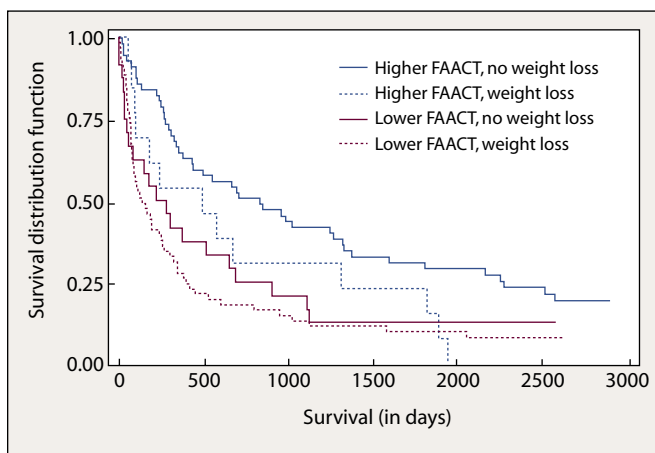
Abbreviations: MSAS-SF = Memorial Symptom Assessment Scale Short Form; CI = confidence interval

with all of the symptom subscales of the MSAS-SF, even after the lack of appetite item was removed to avoid possible overlap (Table 2). The mean FAACT score was 60 (8.7 SD) for patients with no lack of appetite, 46.5 (8.1 SD) for patients with lack of appetite and no distress, 46 (10 SD) for those with a lack of appetite and “a little bit” of distress, 44 (8.8 SD) for patients who reported being “somewhat” distressed, 39 (5.3 SD) for those with “quite a bit” of distress, and 30.3 (8.3 SD)



**Figure 1** Kaplan-Meier Survival by FAACT Score

In univariate analysis, the number of patients divided by the median FAACT scores showed significantly different survival curves ( $P < 0.0001$ ). Abbreviation: FAACT = Functional Assessment of Anorexia/Cachexia Therapy



**Figure 2** Kaplan-Meier Survival by FAACT Score and Distress From Weight Loss

Abbreviation: FAACT = Functional Assessment of Anorexia/Cachexia Therapy

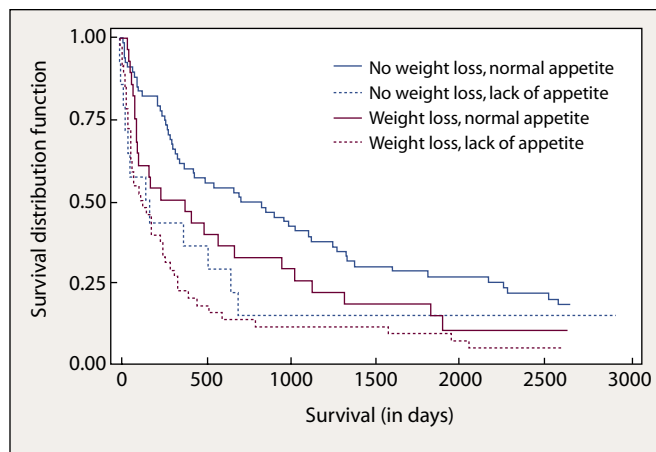
for patients reporting “very much” distress.

The FAACT scores correlated with the laboratory values for serum sodium, cholesterol, albumin, and hemoglobin but not with other laboratory values (Table 3).

**Study 2.** The mean FAACT score was 48 (11.3 SD), the mean NCCTG score was 13 (3.8 SD), and the mean VAS score was 6.3 (2.1 SD). The FAACT scores correlated with the NCCTG scale ( $r = -0.67, P < 0.001$ ) and the vertical VAS scale ( $r = -0.77, P < 0.0001$ ).

**ANOREXIA, WEIGHT LOSS, AND QUALITY OF LIFE**

In all, 96 patients (62%) did not have lack of appetite, 14 patients (9%) had lack of appetite and no distress, 7 patients (4%) had lack of appetite and a little bit of distress, 12 patients (8%) had lack of appetite and were “somewhat” distressed, 11 patients (7%) had quite a bit of distress, and 16 (10%) patients experienced very much distress. The median KPS for patients



**Figure 3** Kaplan-Meier Survival by MSAS-SF Distress From Lack of Appetite and Weight Loss

Abbreviation: MSAS-SF = Memorial Symptom Assessment Scale Short Form

who reported any anorexia was 60% (16 SD) and for patients with no lack of appetite was 80% (14 SD).

Weight loss was reported by 73 patients (47%). Patients who did not complain of weight loss had a median KPS of 80 (16 SD), whereas patients who did complain had a median KPS of 60 (16 SD). Further, 69 patients had no symptoms regarding weight loss or appetite, 14 patients had distress from lack of appetite only, 27 patients had distress from weight loss only, and 46 patients had distress from both.

Correlation of lack of appetite with quality-of-life ratings and symptom distress subscales is presented in Table 2; the correlation with symptom ratings appears in Tables 4 and 5. No association was seen with difficulty concentrating, cough, feeling nervous, numbness/tingling in hands and feet, sweats, problems with sex, itching, mouth sores, hair loss, swelling of arms or legs, or skin changes.

**SURVIVAL**

**Study 1.** When the overall survival of the population of 156 patients was examined, 135 patients (87%) had expired as of December 15, 2004. The median survival was 10.3 months (range, 1 day to 96.2 months).

In univariate analyses, the number of patients divided by the median FAACT scores showed significantly different survival curves (Figure 1), and FAACT scores were significant predictors of survival (hazard ratio [HR] 0.967, 95% confidence interval [CI] 0.95–0.98,  $P < 0.0001$ ). Anorexia was a significant predictor of survival (HR 1.27, 95% CI 1.13–1.43,  $P < 0.0001$ ), and levels of distress from lack of appetite correlated with survival times (Table 6). The survival curve for patients suffering from distress from anorexia alone was indistinguishable from that of patients who had distress from weight loss and/or lack of appetite (Figures 2 and 3).

In a two variable Cox regression survival analysis, both FAACT scores (HR 0.98, 95% CI 0.96–0.99,  $P < 0.012$ ) and distress from weight loss (HR 1.02, 95% CI 1.002–1.033,  $P <$

**Table 6****Survival Associated With Lack of Appetite**

DISTRESS LEVEL	n	QUALITY OF LIFE <sup>a</sup>		EXPIRED (n)	%	DURATION OF SURVIVAL	
		MEAN	RANGE			MEDIAN (m)	RANGE
Normal appetite	96	82	44–103	79	83%	18.5	0.7–87.7
Not at all	14	75.1	52–104	13	93%	1.8	0.03–96.2
A little bit	7	71	52–87	6	86%	11.6	0.8–77.5
Somewhat	12	67	44–93	12	100%	2.6	0.2–64.5
Quite a bit	11	62.2	32–98	10	91%	6.4	0.4–73.9
Very much	16	65.4	36–95	15	94%	2.8	0.2–86

<sup>a</sup>Quality of life as measured by the sum of Functional Assessment of Cancer Therapy (FACT) subscale scores.

0.019) were independently predictive of survival. In a similar model with the distress item, distress from anorexia approached significance (HR 1.14, 95% CI 0.99–1.31,  $P < 0.068$ ), whereas distress from weight loss remained significant (HR 1.02, 95% CI 1.01–1.04,  $P < 0.001$ ). In multivariate analyses, FAACT scores and anorexia ratings were not independent of KPS.

## Discussion

We present data on the epidemiology of lack of appetite and on the FAACT and the MSAS-SF single-item appetite rating in a hematology oncology clinic population.

This study presents new data on appetite ratings as a predictor of survival in VA hematology oncology patients. Both appetite measures were univariate predictors of survival. Patients who experienced no distress from anorexia survived for the shortest time. Ratings of food intake in 150 hospice patients<sup>13</sup> and lack of appetite in 162 palliative care cancer patients<sup>14</sup> were univariate predictors of survival.

Anorexia was an independent predictor of survival among 1,346 lung cancer patients undergoing chemotherapy,<sup>15</sup> 391 symptomatic hormone-refractory prostate cancer patients,<sup>16</sup> and 540 terminally ill cancer patients.<sup>17</sup> These results provide data on lack of appetite in a new patient population and the importance of sample size in determining prognostic factors.

Patient ratings of appetite correlated with extent of disease, performance status, associated symptoms, and quality of life. The FAACT also showed good correlation with two other measures of appetite: the vertical VAS and the NCCTG instrument. The similar findings for two different ways of assessing appetite suggest that both approaches are valid and add to the repertoire of available ways to elicit patient-rated information about appetite. The type of application used may help determine which instrument is most suitable for a certain type of research.

Also of interest is the relationship between lack of appetite and weight loss, which long has been recognized to be an important prognostic indicator in cancer patients.<sup>18</sup> One would assume that anorexia is closely related to weight loss. In this series of patients, however, distress from lack of appetite correlated only modestly with distress from weight loss, and patients complained of one symptom and not the other.

Another intriguing finding from the survival curves is that once appetite scores fell or distress from anorexia was noted,

distress from weight loss became less important. These findings raise the possibility that lack of appetite may be a more sensitive clinical indicator than is weight loss. In one series of patients with advanced gastrointestinal cancer, appetite scores were lower among patients with an acute-phase response, which linked appetite changes with an underlying pathophysiology that could lead to weight loss.<sup>19</sup> In a model that combined anorexia with weight loss, the FAACT, which is a more detailed measure of appetite, provided more survival information than did the single item from the MSAS-SF, suggesting that the way in which appetite is assessed can become important.

As in other studies, lack of appetite was linked with depression, and the findings in this paper also suggested that a number of other symptoms also may be associated with lack of appetite. These findings are relevant in the current search for symptom clusters<sup>20</sup> and in the direction of further symptom assessment.

We were able to correlate anorexia to serum sodium, albumin, cholesterol, and hemoglobin levels. However, the white blood cell and lactate dehydrogenase levels were not correlated with lack of appetite. In one study,<sup>21</sup> clinical investigators examined laboratory values in terminally ill patients with a median survival of 32 days and found the WBC count to be prognostic. The significance of these laboratory findings is unknown but may be helpful in further understanding the pathophysiology of lack of appetite. These results need to be replicated in future studies.

One limitation of the study was that the sample of veteran patients consisted of elderly men exclusively. We did not have data on actual weight loss for many patients. Thus, further work in other populations is needed.

## Conclusion

Patient ratings of appetite provide important information about the patients' overall condition and the need for palliative measures. Instruments such as the FAACT and those that measure distress from anorexia may help to enhance the evaluation of patients who complain of lack of appetite.

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