Evidence-based guidelines for the nutritional management of adult oncology patients

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Anna Arthur, PhD, MPH, RDN

- Assistant Professor and Sylvia D. Stroup Scholar of Nutrition and Cancer at the University of Illinois and Director of Oncology Nutrition Services at Carle Cancer Center in Urbana, IL

- Hold a PhD and MPH in Nutritional Sciences/Epidemiology from the University of Michigan School of Public Health

- Previously worked as a Postdoctoral Scholar with the University of Alabama at Birmingham’s Cancer Prevention and Control Training Program funded by the National Cancer Institute

- Research focuses on elucidating the complex relationships among diet and nutritional status, cancer progression and prognosis, quality of life and cancer-related biomarkers
Learning Objectives

1. The participant will be able to discuss the validity of malnutrition screening and nutrition assessment tools and their utilization in clinical oncology settings.

2. The participant will be able to better utilize the Nutrition Care Process to provide appropriate and high-quality nutrition care to oncology patients.

3. The participant will be able to describe the evidence-based relationships between nutritional status and morbidity and mortality outcomes in oncology.
Over 15.5 million cancer survivors in the U.S.

Cancer Survivor: any person with a history of cancer, from the time of diagnosis through the remainder of life.

Figure 1. Estimated Numbers of US Cancer Survivors

As of January 1, 2016

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate</td>
<td>Breast</td>
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<tr>
<td>3,306,760</td>
<td>3,560,570</td>
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<tr>
<td>Colon &amp; rectum</td>
<td>Uterine corpus</td>
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<tr>
<td>724,690</td>
<td>757,190</td>
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<tr>
<td>Melanoma</td>
<td>Colon &amp; rectum</td>
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<tr>
<td>614,460</td>
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<td>Urinary bladder</td>
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</tr>
<tr>
<td>574,250</td>
<td>630,660</td>
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<tr>
<td>Non-Hodgkin lymphoma</td>
<td>Melanoma</td>
</tr>
<tr>
<td>361,480</td>
<td>612,790</td>
</tr>
<tr>
<td>Kidney &amp; renal pelvis</td>
<td>Non-Hodgkin lymphoma</td>
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<tr>
<td>305,340</td>
<td>Kidney</td>
</tr>
<tr>
<td>Testis</td>
<td>429,010</td>
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<tr>
<td>266,550</td>
<td>Testis</td>
</tr>
<tr>
<td>Lung &amp; bronchus</td>
<td>335,790</td>
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<tr>
<td>238,300</td>
<td>Leukemia</td>
</tr>
<tr>
<td>230,920</td>
<td>318,430</td>
</tr>
<tr>
<td>Leukemia</td>
<td>Lung &amp; bronchus</td>
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<tr>
<td>229,880</td>
<td>288,210</td>
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<tr>
<td>Oral cavity &amp; pharynx</td>
<td>Ovary</td>
</tr>
<tr>
<td>204,040</td>
<td>235,200</td>
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<tr>
<td>Kidney &amp; renal pelvis</td>
<td>Total survivors</td>
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<td></td>
<td>Total survivors</td>
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As of January 1, 2026

<table>
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<tr>
<th>Male</th>
<th>Female</th>
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</thead>
<tbody>
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<td>Prostate</td>
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<tr>
<td>4,521,910</td>
<td>4,571,210</td>
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<td>Melanoma</td>
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<tr>
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<td>229,880</td>
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</table>

NOTE: Beginning with the 2016-2017 edition, estimates for specific cancer types now take into account the potential for a history of more than one cancer type. Estimates should not be compared to those from previous years. See Sources of Statistics, page 34, for more information.

Source: Surveillance Research Program, Division of Cancer Control and Population Sciences, National Cancer Institute.

American Cancer Society, Surveillance and Health Services Research, 2016
Cancer Continuum

- Active treatment
- Recovery immediately after treatment
- Long-term disease-free or stable disease
- Advanced cancer and end of life
Nutritional Needs of Cancer Survivors

• Historically, cancer considered a disease associated with weight loss
  – Diagnosed at later stages
  – High rates of cachexia

• Development of effective cancer screening → earlier detection
  – Primarily for breast, prostate, colorectal, cervical

• Growing number of patients beginning treatment already overweight or obese
  – Weight gain a frequent complication of cancer treatment
Malnutrition Remains a Problem

• Cancer itself and all modalities of cancer treatment can significantly
  – Affect nutritional needs
  – Alter regular eating habits
  – Adversely affect how the body digests, absorbs, and uses food

• Symptoms: anorexia, early satiety, changes in taste and smell, gastrointestinal (GI) disturbances, xerostomia

• Changes may persist post-treatment
### Cancer Cachexia

#### Definition
- Skeletal muscle loss
- Cannot be fully reversed with conventional nutritional support
- Progressive functional impairment
- Anorexia

#### Prevalence
- 83% – 87% pancreatic and gastric
- 48% – 61% head and neck
- 31% - 40% breast, leukemia, non-Hodgkin lymphoma

#### Consequences
- Reduced physical function
- Reduced tolerance to anti-cancer therapy
- Accounts for 20% of cancer-related deaths
Etiology of Cancer Cachexia

Cachexia

- Neuroendocrine dysregulation
- Increased inflammatory cytokines
- Release of tumor-derived catabolic factors
- Impaired anabolism
- Up-regulated tissue catabolism

Nutrition impact symptoms
Hypothesized Cachexia Pathogenesis

# Cachexia vs. Starvation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Cachexia</th>
<th>Starvation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resting energy expenditure</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Skeletal muscle loss</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Fat loss</td>
<td>++</td>
<td>+ +</td>
</tr>
<tr>
<td>Visceral muscle loss</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Acute-phase response</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Proinflammatory cytokines</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Toxohormones</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Increased liver metabolism</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Liver size</td>
<td>++</td>
<td>- -</td>
</tr>
</tbody>
</table>

Poor Nutritional Status Before and During Cancer Treatment

- Higher rates of hospital admissions or readmissions
- Increased length of stay
- Lower quality of life
- Decreased tolerance to radiation therapy and chemotherapy
- Increased susceptibility to infection
- Increased mortality

Early nutrition assessment and intervention is critical!
Nutritional Assessment of the Cancer Patient

- Food and nutrition-related history
- Anthropometric measures
- Nutrition impact symptoms
- Nutrition focused physical findings
Food/Nutrition-Related History

- Energy and protein intake (24 hour recall)
- Changes in food and fluid/beverage intake
- Adequacy and appropriateness of nutrient intake or nutrient administration
- Actual daily intake from enteral and parenteral nutrition and other nutrient sources
- Changes in type, texture or temperature of food and liquids
- Food avoidance and intolerances
- Meal or snack pattern changes
- Rx meds, OTC meds, herbals, CAM products
- Factors affecting access to foods
Anthropometric Measurements

- Height and weight
- Weight change
- BMI
- Any **unintended** weight loss has potential significance
  - Low muscle mass predictor of immobility and mortality
  - Particularly adverse prognostic in obese
  - Increased susceptibility to tx toxicities leading to tx breaks, dose reductions, tx delays, tx termination
Biochemical Data

• Glucose (hyperglycemia common in cancer)

• White blood cell count

• Nutrition-related anemia profile (hemoglobin, hematocrit, folate, B12, iron)

• Electrolyte and renal profile

• Liver function

• Inflammatory profile (CRP, albumin)

• GI function tests (eg, swallow eval, gastric emptying)
Nutrition Impact Symptoms

• Symptoms and side effects of cancer and cancer treatment that directly affect nutrition status

• What might be some of these symptoms? Why?
  – Weight loss
  – Anorexia
  – Nausea/vomiting
  – Diarrhea
  – Constipation
  – Fatigue
  – Neutropenia
  – Dysgeusia
  – Xerostomia
  – Mucositis/stomatitis
Nutrition-Focused Physical Findings

• Older than age 65y
• Loss of muscle mass
• Loss of subcutaneous fat
• Presence of pressure ulcers or wounds
• Localized or generalized fluid accumulation
Nutrition-Focused Physical Findings

• Vital signs (febrile increases protein-energy needs)

• Functional indicators (eg, karnofsky score, grip strength)

• Previous/current/planned medical treatment or therapy

• Other diseases, conditions and illnesses

• Social hx: psychological/socioeconomic factors (eg, social support)
Malnutrition Screening

Academy of Nutrition and Dietetics (AND) Evidence Analysis Library (EAL) Recommendation:
“RDNs should use an assessment tool validated in the setting in which the tool is intended for use as part of the complete nutrition assessment.”

www.andeal.org
Nutrition Assessment in Oncology

Malnutrition Screening Tools
• Determines risk for malnutrition
• Identifies patients who would benefit from nutrition assessment and intervention by an RDN
• Valid and reliable tools in oncology
  • Ambulatory: Malnutrition Screening Tool (MST)
  • Acute care: MST, Malnutrition Screening Tool for Cancer Patients, Malnutrition Universal Screening Tool (MUST)

Nutrition Assessment Tools
• Determines presence of malnutrition
• Patient Generated Subjective Global Assessment (PG-SGA) and Subjective Global Assessment (SGA) both valid and reliable in identifying malnutrition in both ambulatory and acute care settings

Thompson et al. JAND, 2017
Patient-Generated Subjective Global Assessment (PG-SGA)

• Correlates strongly with biochemical measures of nutritional status

• Predicts morbidity, mortality and quality of life

• Developed and validated specifically for use in cancer patients

• Accepted by the AND Oncology Nutrition Dietetics Practice Group (DPG) as the standard for nutrition assessment for patients with cancer

PG-SGA

Includes four patient-generated historical components
PG-SGA

Includes four patient-generated historical components

Scored Patient-Generated Subjective Global Assessment (PG-SGA)

History: Boxes 1 - 4 are designed to be completed by the patient. [Boxes 1-4 are referred to as the PG-SGA Short Form (SF)]

1. Weight (See Worksheet 1)
   In summary of my current and recent weight:
   - I currently weigh about ___ kg
   - I am about ___ cm tall
   - One month ago I weighed about ___ kg
   - Six months ago I weighed about ___ kg
   During the past two weeks my weight has:
   - decreased (1)
   - not changed (0)
   - increased (0)

2. Food intake: As compared to my normal intake, I would rate my food intake during the past month as
   - unchanged (0)
   - more than usual (0)
   - less than usual (1)
   I am now taking
   - normal food but less than normal amount (1)
   - little solid food (2)
   - only liquids (3)
   - only nutritional supplements (3)
   - very little of anything (4)
   - only tube feedings or only nutrition by vein (0)

3. Symptoms: I have had the following problems that have kept me from eating enough during the past two weeks (check all that apply)
   - no problems eating (0)
   - no appetite, just did not feel like eating (3)
   - nausea (1)
   - constipation (1)
   - mouth sores (2)
   - things taste funny or have no taste (1)
   - problems swallowing (2)
   - pain; where? (3)
   - other (1)**
   **Examples: depression, money, or dental problems

4. Activities and Function:
   Over the past month, I would generally rate my activity as:
   - normal with no limitations (0)
   - not my normal self, but able to be up and about with fairly normal activities (1)
   - not feeling up to most things, but in bed or chair less than half the day (2)
   - able to do little activity and spend most of the day in bed or chair (3)
   - pretty much bed ridden, rarely out of bed (3)

The remainder of this form is to be completed by your doctor, nurse, dietitian, or therapist. Thank you.

Additive Score of Boxes 1-4 [ ] A

pt-global.org
PG-SGA

Includes four patient-generated historical components
PG-SGA

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Scoring Patient-Generated Subjective Global Assessment (PG-SGA)

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Additive Score of Boxes 1-4

pt-global.org
### Worksheet 1 – Scoring Weight Loss

<table>
<thead>
<tr>
<th>Weight loss in 1 month</th>
<th>Points</th>
<th>Weight loss in 6 months</th>
<th>Points</th>
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<td>20% or greater</td>
<td>4</td>
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<tr>
<td>5-9.9%</td>
<td>3</td>
<td>10-19.9%</td>
<td>2</td>
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<td>3-4.9%</td>
<td>2</td>
<td>6-9.9%</td>
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<td>0-1.9%</td>
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<td>0-1.9%</td>
<td>0</td>
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</tbody>
</table>

**Numerical score from Worksheet 1**

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### Worksheet 2 – Disease and its relation to nutritional requirements:

- **Score is derived by adding 1 point for each of the following conditions:**
  - Cancer
  - Presence of decubitus, open wound or fistula
  - AIDS
  - Presence of trauma
  - Pulmonary or cardiac cachexia
  - Age greater than 65
  - Chronic renal insufficiency

**Numerical score from Worksheet 2**

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### Worksheet 3 – Metabolic Demand

Score for metabolic stress is determined by a number of variables known to increase protein & caloric needs. **Note:** Score fever intensity or duration, whichever is greater. The score is additive so that a patient who has a fever of 38.8°C (5 points) for <72 hrs (1 point) and who is on 10 mg of prednisone chronically (2 points) would have an additive score for this section of 5 points.

**Numerical score from Worksheet 3**

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### Worksheet 4 – Physical Exam

Exam includes a subjective evaluation of 4 aspects of body composition: fat, muscle, fluid. Since this is subjective, each aspect of the exam is rated for degree. Muscle deficit/loss impacts point score more than fat deficit/loss. Definitions of categories: 0 = no abnormality, 1 = mild, 2 = moderate, 3 = severe. Rating in these categories is not additive but are used to clinically assess the degree of deficit (or presence of excess fluid).

**Numerical score from Worksheet 4**

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### Worksheet 5 – PG-SGA Global Assessment Categories

- **Nutritional Triage Recommendations:** Additive score is used to define specific nutritional interventions including patient & family education, symptoms management including pharmacologic intervention, and appropriate nutrient intervention (food, nutritional supplements, enteral, or parenteral route).

- **First line nutrition intervention includes optimal symptom management.**

- **Triage based on PG-SGA point score:**
  - 0-1: No intervention required at this time. Re-assessment on routine and regular basis during treatment.
  - 2-3: Patient & family education by dietitian, nurse, or other clinician with pharmacologic intervention as indicated by symptom survey (Box 3) and lab values as appropriate.
  - 4-8: Requires intervention by dietitian, in conjunction with nursing or physician as indicated by symptoms (Box 3).
  - 9+ indicates a critical need for improved symptom management and or nutrient intervention options.

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email: faithhotterymdphd@aol.com or info@pt-global.org
### Scored Patient-Generated Subjective Global Assessment (PG-SGA)

**Worksheet 1 – Scoring Weight Loss**

To determine score, use 1-month weight data if available. Use 6-month data only if there is no 1-month weight data. Use points below to score weight change and add one extra point if patient has lost weight during the past 2 weeks. Enter total point score in Box 1 of PG-SGA.

<table>
<thead>
<tr>
<th>Weight loss in 1 month</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% or greater</td>
<td>4</td>
</tr>
<tr>
<td>5-9.9%</td>
<td>3</td>
</tr>
<tr>
<td>3-4.9%</td>
<td>2</td>
</tr>
<tr>
<td>1-2.9%</td>
<td>1</td>
</tr>
<tr>
<td>0-1.9%</td>
<td>0</td>
</tr>
</tbody>
</table>

**Worksheet 2 – Disease and its relation to nutritional requirements:**

Score is derived by adding 1 point for each of the following conditions:

- [ ] Cancer
- [ ] Presence of decubitus, open wound or fistula
- [ ] AIDS
- [ ] Presence of trauma
- [ ] Pulmonary or cardiac cachexia
- [ ] Age greater than 65
- [ ] Chronic renal insufficiency

**Worksheet 3 – Metabolic Demand**

Score for metabolic stress is determined by a number of variables known to increase protein & caloric needs. **Note:** Score fever intensity or duration, whichever is greater. The score is additive so that a patient who has a fever of 38.8 °C (3 points) for < 72 hrs (1 point) and who is on 10 mg of prednisone chronically (2 points) would have an additive score for this section of 5 points.

**Worksheet 4 – Physical Exam**

Examine a subjective evaluation of 3 aspects of body composition: fat, muscle, & fluid. Since this is subjective, each aspect of the exam is rated for degree. Muscle deficit/loss impacts point score more than fat deficit/loss. Definition of categories: 0 = no abnormality, 1 = mild, 2 = moderate, 3 = severe. Rating in these categories is not additive but are used to clinically assess the degree of deficit or presence of excess fluid.

**Worksheet 5 – PG-SGA Global Assessment Categories**

**Nutritional Triage Recommendations:**

Additive score is used to define specific nutritional interventions including patient & family education, symptoms management including pharmacologic intervention, and appropriate nutrient intervention (food, nutritional supplements, enteral, or parenteral route). First line intervention includes optimal symptom management.

**Triage based on PG-SGA point score**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1</td>
<td>No intervention required at this time. Re-assessment on routine and regular basis during treatment.</td>
</tr>
<tr>
<td>2-3</td>
<td>Patient &amp; family education by dietician, nurse, or other clinician with pharmacologic intervention as indicated by symptom survey (Box 3) and lab values as appropriate.</td>
</tr>
<tr>
<td>4-8</td>
<td>Requires intervention by dietician, in conjunction with nurse or physician as indicated by symptoms (Box 3).</td>
</tr>
<tr>
<td>9+</td>
<td>Indicates a critical need for improved symptom management and or nutritional intervention options.</td>
</tr>
</tbody>
</table>

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**PG-SGA: Professional Component**

### Worksheet 1 – Scoring Weight Loss

<table>
<thead>
<tr>
<th>Weight loss in 1 month</th>
<th>Weight loss in 6 months</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% or greater</td>
<td>20% or greater</td>
<td>4</td>
</tr>
<tr>
<td>5-9.9%</td>
<td>10-19.9%</td>
<td>3</td>
</tr>
<tr>
<td>3-4.9%</td>
<td>6-9.9%</td>
<td>2</td>
</tr>
<tr>
<td>2-2.9%</td>
<td>2-5.9%</td>
<td>2</td>
</tr>
<tr>
<td>0-1.9%</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Numerical score from Worksheet 1**

---

### Worksheet 2 – Disease and its relation to nutritional requirements

- **Score is derived by adding 1 point for each of the following conditions:**
  - Cancer
  - Presence of decubitus, open wound or fistula
  - AIDS
  - Presence of trauma
  - Pulmonary or cardiac cachexia
  - Age greater than 65
  - Chronic renal insufficiency
  - Other relevant diagnoses (specify)

**Numerical score from Worksheet 2**

---

### Worksheet 3 – Metabolic Demand

**Note:** Score fever intensity or duration, whichever is greater. The score is additive so that a patient who has a fever of 38.8 °C (3 points) for < 72 hrs (1 point) and who is on 10 mg of prednisone chronically would have an additive score for this section of 4 points.

<table>
<thead>
<tr>
<th>Stress</th>
<th>none (0)</th>
<th>low (1)</th>
<th>moderate (2)</th>
<th>high (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>no fever</td>
<td>&gt; 37.2 and &lt; 38.5</td>
<td>≥ 38.3 and &lt; 38.8</td>
<td>≥ 38.8</td>
</tr>
<tr>
<td>Fever duration</td>
<td>&lt; 72 hours</td>
<td>low dose</td>
<td>moderate dose</td>
<td>high dose</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>no corticosteroids</td>
<td>(&lt; 10 mg prednisone equivalents/day)</td>
<td>(≤ 10 and &lt; 30 mg prednisone equivalents/day)</td>
<td>&gt; 30 prednisone equivalents/day</td>
</tr>
</tbody>
</table>

**Numerical score from Worksheet 3**

---

### Worksheet 4 – Physical Exam

**Note:** Score is subjective, each aspect of the exam is rated for degree. Muscle deficit/loss impacts point score. More than fat deficit. Loss of muscle mass impacts point score.

<table>
<thead>
<tr>
<th>Muscle Status</th>
<th>0</th>
<th>1+</th>
<th>2+</th>
<th>3+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporalis</td>
<td>0</td>
<td>1+</td>
<td>2+</td>
<td>3+</td>
</tr>
<tr>
<td>Clavicle</td>
<td>0</td>
<td>1+</td>
<td>2+</td>
<td>3+</td>
</tr>
<tr>
<td>Shoulder</td>
<td>0</td>
<td>1+</td>
<td>2+</td>
<td>3+</td>
</tr>
<tr>
<td>Interossei</td>
<td>0</td>
<td>1+</td>
<td>2+</td>
<td>3+</td>
</tr>
<tr>
<td>Scapula</td>
<td>0</td>
<td>1+</td>
<td>2+</td>
<td>3+</td>
</tr>
<tr>
<td>Thigh</td>
<td>0</td>
<td>1+</td>
<td>2+</td>
<td>3+</td>
</tr>
<tr>
<td>calf</td>
<td>0</td>
<td>1+</td>
<td>2+</td>
<td>3+</td>
</tr>
</tbody>
</table>

**Numerical score from Worksheet 4**

---

### Worksheet 5 – PG-SGA Global Assessment Categories

**Nutritional Triage Recommendations:**

- **First line nutrition intervention includes optimal symptom management.**
- **Triage based on PG-SGA point score:**
  - 0-1: No intervention required at this time. Re-assessment on routine and regular basis during treatment.
  - 2-3: Patient & family education by dietician, nurse, or other clinician with pharmacologic intervention as indicated by symptom survey (Box 3) and lab values as appropriate.
  - 4-8: Requires intervention by dietitian, in conjunction with nurse or physician as indicated by symptoms (Box 3).
  - 9+ Indicates a critical need for improved symptom management and/or nutritional intervention options.

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**PG-SGA: Professional Component**

### Worksheet 1 – Scoring Weight Loss

<table>
<thead>
<tr>
<th>Weight loss in 1 month Points</th>
<th>Weight loss in 6 months Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% or greater 4</td>
<td>20% or greater 3</td>
</tr>
<tr>
<td>5-9.9% 3</td>
<td>10-19.9% 2</td>
</tr>
<tr>
<td>3-4.9% 2</td>
<td>6-9.9% 1</td>
</tr>
<tr>
<td>2-2.9% 1</td>
<td>1-5.9% 1</td>
</tr>
<tr>
<td>0-1.9% 0</td>
<td></td>
</tr>
</tbody>
</table>

**Numerical score from Worksheet 1**

### Worksheet 2 – Disease and its relation to nutritional requirements:

- Score is derived by adding 1 point for each of the following conditions:
  - Cancer
  - Presence of decubitus, open wound or fistula
  - AIDS
  - Presence of trauma
  - Pulmonary or cardiac cachexia
  - Prescribed non-steroidal anti-inflammatory drugs
  - Chronic renal insufficiency
  - Age greater than 65
  - Other relevant diagnoses (specify)

**Numerical score from Worksheet 2**

### Worksheet 3 – Metabolic Demand

Score for metabolic stress is determined by a number of variables known to increase protein & caloric needs. **Note:** Score fever intensity or duration, whichever is greater. The score is additive so that a patient who has a fever of 38.8°C (5 points) and who is on 10 mg of prednisone chronically (2 points) would have an additive score for this section of 7 points.

<table>
<thead>
<tr>
<th>Stress</th>
<th>none (0)</th>
<th>low (1)</th>
<th>moderate (2)</th>
<th>high (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>no fever</td>
<td>&gt; 37.2 and &lt; 38.3</td>
<td>38.3 and &lt; 38.8</td>
<td>≥ 38.8°C</td>
</tr>
<tr>
<td>Fever duration</td>
<td>no fever</td>
<td>&lt; 72 hours</td>
<td>72 hours</td>
<td>&gt; 72 hours</td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>no corticosteroids</td>
<td>low dose (&lt; 10 mg prednisone equivalents/day)</td>
<td>moderate dose ≥ 10 and &lt; 30 mg prednisone equivalents/day</td>
<td>high dose ≥ 30 mg prednisone equivalents/day</td>
</tr>
</tbody>
</table>

**Numerical score from Worksheet 3**

### Worksheet 4 – Physical Exam

Exam includes a subjective evaluation of 3 aspects of body composition: fat, muscle, & fluid. Since this is subjective, each aspect of the exam is rated for degree. Muscle deficit/lipid loss impacts point score more than fat deficit/lipid loss.

**Point score for the physical exam is determined by the overall subjective rating of the total body deficit.**

- No deficit score = 0 points
- Mild deficit score = 1 point
- Moderate deficit score = 2 points
- Severe deficit score = 3 points

**Muscle Status**

- Temporalis: 0 = normal, 1 = weak, 2 = moderate, 3 = severe
- Clavicular: 0 = normal, 1 = weak, 2 = moderate, 3 = severe
- Shoulder: 0 = normal, 1 = weak, 2 = moderate, 3 = severe
- Intercostals: 0 = normal, 1 = weak, 2 = moderate, 3 = severe
- Scapula: 0 = normal, 1 = weak, 2 = moderate, 3 = severe
- Fluid status: 0 = normal, 1 = mild, 2 = moderate, 3 = severe

**Numerical score for Worksheet 4**

### Worksheet 5 – PG-SGA Global Assessment Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Stage A</th>
<th>Stage B</th>
<th>Stage C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>No weight loss</td>
<td>Partial weight gain</td>
<td>Severe weight loss</td>
</tr>
<tr>
<td>Nutritional intake</td>
<td>No deficit</td>
<td>Significant improvement</td>
<td>Moderate/malnutrition</td>
</tr>
<tr>
<td>Physical function</td>
<td>No deficit</td>
<td>Significant improvement</td>
<td>Severe functional deficit</td>
</tr>
<tr>
<td>Physical exam</td>
<td>No deficit</td>
<td>Significant improvement</td>
<td>Severe functional deficit</td>
</tr>
</tbody>
</table>

**Nutritional Triage Recommendations:**

- Additive score is used to define specific nutritional interventions including patient & family education, symptoms management including pharmacologic intervention, and appropriate nutrient intervention (food, nutritional supplements, enteral, or parenteral feeding).
- First line nutrition intervention includes optimal symptom management.

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**PG-SGA: Professional Component**

### Worksheet 1 – Scoring Weight Loss

To determine score, use 1-month weight data if available. Use 6-month data only if there is no 1-month weight data. Use points below to score weight change and add one extra point if patient has lost weight during the past 2 weeks. Enter total point score in Box 1 of PG-SGA.

<table>
<thead>
<tr>
<th>Weight loss in 1 month</th>
<th>Points</th>
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<tbody>
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</tr>
<tr>
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<td>2</td>
<td>6-9.9%</td>
</tr>
<tr>
<td>2-2.9%</td>
<td>1</td>
<td>4-5.9%</td>
</tr>
<tr>
<td>0-1.9%</td>
<td>0</td>
<td>2-3.9%</td>
</tr>
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</table>

**Numerical score from Worksheet 1**

### Worksheet 2 – Disease and its relation to nutritional requirements:

- Score is derived by adding 1 point for each of the following conditions:
  - Cancer
  - Presence of decubitus, open wound or fistula
  - AIDS
  - Presence of trauma
  - Pulmonary or cardiac cachexia
  - Age greater than 65
  - Chronic renal insufficiency

- Other relevant diagnoses (specify)

**Numerical score from Worksheet 2**

### Worksheet 3 – Metabolic Demand

Score for metabolic stress is determined by a number of variables known to increase protein & caloric needs. **Note**: Score fever intensity or duration, whichever is greater. The score is additive so that a patient who has a fever of 38.8°C (3 points) for < 72 hrs (1 point) and who is on 10 mg of prednisone chronically (2 points) would have an additive score for this section of 5 points.

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**Numerical score from Worksheet 3**

### Worksheet 4 – Physical Exam

Exam includes a subjective evaluation of 3 aspects of body composition: fat, muscle, & fluid. Since this is subjective, each aspect of the exam is rated for degree. Muscle deficit/loss impacts point score. More fat than fat loss loss. Definitions of categories: 0 = no abnormality, 1 = mild, 2 = moderate, 3 = severe. Rating in these categories is not additive but are used to clinically assess the degree of deficit or presence of excess fluid.

**Numerical score for Worksheet 4**

### Total PG-SGA Score

**Total PG-SGA Score (Total numerical score of A+B+C+D)**

**Global PG-SGA Category Rating (Stage A, Stage B or Stage C)**

**Nutritional Triage Recommendations**: Additive score is used to define specific nutritional interventions including patient & family education, symptom management including pharmacologic intervention, and appropriate nutrient intervention (food, nutritional supplements, enteral, or parenteral route).

First line nutrition intervention includes optimal symptom management.

Triage based on PG-SGA point score:

- 0-1: No intervention required at this time. Re-assessment on routine and regular basis during treatment.
- 2-3: Patient and family education by dietician, nurse, or other clinician with pharmacologic intervention as indicated by symptom survey (Box 3) and lab values as appropriate.
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- 9: Indicates a critical need for improved symptom management and/or nutrient intervention options.

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Nutrition Intervention for Cancer Survivors

• During treatment, overall goals of nutritional care for survivors should be:
  – to prevent or resolve nutrient deficiencies,
  – achieve or maintain a healthy weight,
  – preserve lean body mass,
  – minimize nutrition-related side effects
  – maximize quality of life

• After treatment, follow guidelines for cancer prevention (and prevention of other diseases)
Managing Malnutrition/Cachexia

• Energy
  – Effects of cancer on energy expenditure is variable
    • 173 GI cancer patients (Dempsey et al., Cancer 1984):
      – 36% hypometabolic, 22% hypermetabolic, 42% normometabolic

• Tumor-driven and potentially cancer-specific
  – Pancreatic, gastric, biliary/hepatic hypermetabolic
  – Reassess often, especially after surgery
Managing malnutrition/cachexia

• Energy
  – Proper assessment of individual needs is critical
    • Use standard equations (Mifflin-St. Jeor, Ireton-Jones) or indirect calorimetry to estimate needs

<table>
<thead>
<tr>
<th>Condition</th>
<th>Energy Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer, nutritional repletion, weight gain</td>
<td>30-40 kcal/kg/day</td>
</tr>
<tr>
<td>Cancer, normometabolic</td>
<td>25-30 kcal/kg/day</td>
</tr>
<tr>
<td>Cancer, hypermetabolic</td>
<td>35 kcal/kg/day</td>
</tr>
<tr>
<td>Septic cancer patient</td>
<td>25-30 kcal/kg/day</td>
</tr>
<tr>
<td>Obese cancer patient</td>
<td>21-25 kcal/kg/day</td>
</tr>
</tbody>
</table>
Managing malnutrition/cachexia

• Protein
  – Illness and surgery increases protein needs
  – Energy malnutrition can lead to lean body mass catabolism
  – Protein prescription is multifactorial
    • Body weight
    • Degree of malnutrition
    • Extent of disease
    • Absorptive and metabolic capacity
    • Generally: 1.5 – 2.5 g/kg/day
Nutrition Intervention

• Oral intake (P.O.)
  – Most patients
  – Oral supplements available
  – Specialized dietary restrictions
    • E.g., Pre/Post-surgical (“Clear”)

• Enteral
  – Where oral ingestion insufficient, but GI functional
  – Ex: Head and neck cancer → mucositis/dysphagia

• Parenteral
  – GI function insufficient
Management of Nutrition Impact Symptoms

• Krause, pg 741-2, Table 36-7

• American Institute for Cancer Research
  – http://www.aicr.org/patients-survivors/cancerresource/cancerresource-side-effects.html

• American Cancer Society
What are the most challenging nutritional issues that you face when working with oncology patients?
Supplements/Other Dietary Considerations

- **Antioxidant supplementation discouraged**
  - May interfere with efficacy of chemo and radiation therapies

- **Fish oil (0.77 – 6.0g/day; strong evidence)**
  - Weight gain or stabilization in presence of weight loss
  - Improvement or preservation of LBM
  - More research needed to determine optimal dose

- **Glutamine (weak evidence)**
  - Treatment of oral mucositis
  - Improved nitrogen balance and decreased morbidity in hematopoietic cell transplant patients receiving parenteral glutamine

- **Neutropenic dietary precautions**
  - Safe food handling and foods that may pose infectious risks
  - Beneficial in general oncology patients with neutropenia
  - Effectiveness unlikely in bone marrow transplant patients
American Institute for Cancer Research (AICR) Guidelines for Cancer Survivors

1. Be as lean as possible without becoming underweight.
2. Be physically active for at least 30 minutes every day.
3. Avoid sugary drinks, and limit consumption of energy-dense foods (particularly processed foods high in added sugar, low in fiber or high in fat).
4. Eat more of a variety of vegetables, fruits, whole grains and legumes such as beans.
5. Limit consumption of red meats (such as beef, pork and lamb) and avoid processed meats.
6. If consumed at all, limit alcoholic drinks to two for men and one for women a day.
7. Limit consumption of salty foods and foods processed with salt (sodium).
8. Do not rely on supplements to protect against cancer.
Take Home Messages

• Despite growing number of overweight/obese oncology patients, malnutrition remains a problem
• Poor nutrition $\rightarrow$ poor outcomes
  – Increased morbidity and mortality
• PG-SGA is a valid and reliable tool for identifying malnutrition in acute and ambulatory oncology settings
• Comprehensive nutritional assessment and intervention should occur early and often
Questions?
Connect with MFLN Nutrition & Wellness Online!

MFLN Nutrition and Wellness
MFLN Nutrition @MFLNNW
MFLN Nutrition and Wellness
We invite **MFLN Service Provider Partners** to our private LinkedIn Group!

DoD
Branch Services
Reserve
Guard
Cooperative Extension

https://www.linkedin.com/groups/8409844
Evaluation and CPEUs/Certificate of Completion

MFLN Nutrition and Wellness is offering 1.0 CPEU for today’s webinar.

• Please complete the evaluation at: https://vte.co1.qualtrics.com/jfe/form/SV_aaCkdHMg1f4wVx3

• Follow the link, provide your email and credentials and the certificate will be emailed to you.
Nutrition and Wellness
Upcoming Event

• Responsive Feeding: Understanding when and how to develop a feeding relationship with infants.
  • Date: Tues, June 27, 2017
  • Time: 12:00 pm Eastern
  • Location: https://learn.extension.org/events/3068

For more information on MFLN Nutrition and Wellness go to: 
https://militaryfamilies.extension.org/nutrition-and-wellness/
MILITARY FAMILIES LEARNING NETWORK

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- Personal Finance
- Military Caregiving
- Family Development
- Family Transitions
- Network Literacy
- Nutrition & Wellness
- Community Capacity Building

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