Nestlé Nutrition Institute

The Adult Malnutrition Consensus Criteria: How to Apply to Your Practice

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Disclosure

Financial Support for this presentation was provided by Nestlé Health Science. The views expressed herein are those of the presenter and do not necessarily represent Nestlé's views. The material herein is accurate as of the date it was presented, and is for educational purposes only and is not intended as a substitute for medical advice.

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Objectives

- Describe the practical steps for determining an adult patient's malnutrition etiology.
- Describe the six malnutrition criteria and outline processes for their identification in specific patients.
- Outline an implementation process for use of the adult malnutrition consensus characteristics and their inclusion in the nutrition care process.

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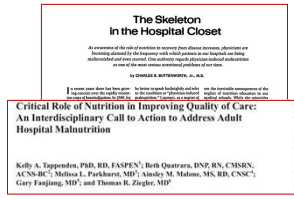
Malnutrition – Longstanding Issue

PERCENTAGE OF WEIGHT LOSS: BASIC INDICATOR OF SURGICAL RISK IN PATIENTS WITH CHRONIC PEPTIC ULCER

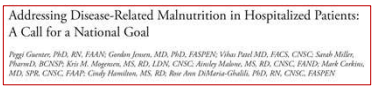
HIRAM O. STUDLEY

J Am Med Assoc. 1936;106(6):458-460


The Skeleton in the Hospital Closet

Critical Role of Nutrition in Improving Quality of Care: An Interdisciplinary Call to Action to Address Adult Hospital Malnutrition

Kelly A. Tappenden, PhD, RD, FASPEN[1]; Beth Quatrara, DNP, RN, CMSRN, ACNS-BC[2]; Melissa L. Parkhurst, MD[3]; Ainsley M. Malone, MS, RD, CNSC[4]; Gary Fanjiang, MD[5]; and Thomas R. Ziegler, MD[6]


Addressing Disease-Related Malnutrition in Hospitalized Patients: A Call for a National Goal

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Malnutrition Is Common in Hospitalized Patients

- Malnutrition is present in 25%-54% hospitalized patients at admission
- Data from 1976 - 2018
- Various malnutrition assessment methods were used
- Prevalence rates vary based on populations studied

Population	# of Patients	Malnourished Patients
Acute Care[1]	251	44%
Acute Care[2]	2448	39%
ICU[3]	129	43%
Acute Care[4]	404	54%
ICU[5]	57	50%
Acute Care and ICU[6]	274	32%/44%
Acute Care[7]	404	48%
Pancreatic Surgery[8]	43	56%
Acute Care[9]	3759	68%
Critically Ill[10]	327	30%

Source: 1 Bistrian, 1976; 2 VA Study 1991; 3 Giner 1996; 4 Braunschweig, 2000; 5 Sheehan 2010; 6 Nicolo 2013; 7 Hiller 2016; 8 Berry 2016; 9 Hudson 2017; 10 Ceniccola 2018

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Impact on Patient Outcomes

- *Patient Characteristics and the Occurrence of Never Events*
- US epidemiologic analysis of 887,189 surgery cases from 1368 hospitals, using HCUP NIS data from 2002-2005
- *Malnutrition can dramatically increase the risk of severe events*
  - *4X more likely to develop pressure injuries*
  - *2X more likely to have SSI*
  - *5X more likely to have CAUTI*

Fry et al, Arch Surg 2010;145(2):148-51

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Impact on Patient Outcomes

Table 3. Predictive Variables Included in Each Equation and Their Associated Odds Ratios

Complication	Age, y	OR	Preexisting Conditions	OR	Operative Procedures	OR
Clostridium difficile enterocolitis	>75 y	2.7	Malnutrition/weight loss	3.0	Aortofemoral bypass	6.5
			Chronic renal failure	2.7	Colon resection	5.5
			Emergency admission	1.8	CABG surgery	3.5
Methicillin-resistant *Staphylococcus aureus* infection			Diabetic complications	3.3	Colon resection	21.3
			Weight loss	2.9	Aortofemoral bypass	11.9
			Chronic lung disease	2.4	CABG surgery	6.5
			Emergency admission	2.3		
Mediastinitis after CABG surgery			Malnutrition/weight loss	5.3		
			Chronic renal failure	5.2		
Surgical site infection			Malabsorption	2.9	Colon resection	5.2
			Malnutrition/weight loss	2.5		
			Congestive heart failure	2.2		
			Chronic renal failure	2.0		
Postoperative pneumonia	>85	5.2	Malnutrition/weight loss	2.8	Aortofemoral bypass	5.3
	75-84	3.7	Chronic renal failure	2.5	CABG surgery	3.8
	65-74	2.2	Chronic lung disease	2.2	Colon resection	2.6
			Emergency admission	2.1		
			Alcohol abuse	2.0		
			Congestive heart failure	2.0		
			Malnutrition/weight loss	2.9		
Intravascular device infection	>85	1.8	Malnutrition/weight loss	16.4	Aortofemoral bypass	2.3
			Chronic renal failure	4.3		
Catheter-associated urinary tract infection	>85	5.8	Urinary tract obstruction	5.8	CABG surgery	2.2
	75-84	3.7	Malnutrition/weight loss	5.1		
	65-74	2.2				
Decubitus ulcer	>85	10.4	Diabetic complications	5.3	Aortofemoral bypass	3.8
	75-84	7.7	Chronic renal failure	4.7	CABG surgery	3.3
			Malnutrition/weight loss	3.8	Colon resection	2.4
			Peripheral vascular disease	2.3		
			Emergency admission	2.0		

Fry et al, Arch Surg 2010;145(2):148-51

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Impact on Patient Outcomes

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			Peripheral vascular disease	2.3		
			Emergency admission	2.0		

Weight loss and/or malnutrition significantly increased risk of all complications

Fry et al, Arch Surg 2010;145(2):148-51

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Malnutrition and Mortality

- Evaluation of a Veterans Administration population
  - Sepsis, respiratory disease, cancer, gastrointestinal
  - N=404
- Utilized ASPEN/Academy malnutrition characteristics

Table 4. Comparison of Outcomes Between Malnourished and Nonmalnourished Patients.*

Outcome	Malnourished (n = 202)	Nonmalnourished (n = 202)	Odds Ratio (95% CI) Unadjusted
Met composite end point	108 (53)	36 (18)	5.30 (3.36-8.34)†
Readmit within 30 days of discharge	63 (31)	24 (12)	3.36 (1.99-5.65)†
Died within 90 days of discharge	65 (32)	16 (8)	5.52 (3.06-9.95)†
Length of stay >7 days	83 (41)	28 (14)	4.33 (2.66-7.06)†
Length of stay, mean (SD), d	9.8 (11.5)	4.4 (4.5)	

*Values are presented as number (%) unless otherwise indicated.
†P < .001.

Hiller L. JPEN 2017;41(8):1316

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AHRQ – HCUP 2016

HCUP STATISTICAL BRIEF #210

September 2016

Characteristics of Hospital Stays Involving Malnutrition, 2013

Highlights

- In 2013, there were nearly 2 million hospital inpatient stays involving malnutrition. The most common type was protein-calorie malnutrition (63.3 percent of all malnutrition stays), accounting for 4.5 percent of all inpatient stays and 5.1 percent of aggregate costs (nonmaternal and nonneonatal only).

2013 NIS data

- 1.95 million hospital stays that involved malnutrition (7.1% of nonmaternal, non-neonatal hospital stays)
- Highest category was protein-calorie malnutrition at 1.25 million or 64%

Human Cost
Most malnutrition-related stays have a substantially higher proportion of in-hospital deaths
1.5x to 5x higher
than those unrelated to malnutrition

Longer Hospital Stays
Most hospital stays were
2x longer
47%-71%
of patients with malnutrition did not have a routine discharge

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Malnutrition defined by Academy/ASPEN and Outcomes

Author	Population	Study Design	Length of Stay	Readmission	Mortality
Hudson	Hospitalized patients- ALL including critical care 3907 patients	Retrospective Review (Hand grip measures excluded)	Mean 14.99 days vs. 11.85 days p= .0067 Time to discharge alive p<0.0001 (HR 0.58)	30 day (adjusted) 40% vs. 23% P<0.001 (OR 2.13) p<0.001	In-hospital (adjusted) 8% vs 5% 1.5 times more likely to die (OR 1.47) p= 0.0102
Mosquera	GI Surgical oncology 490 patients	Retrospective review	Mean 13.3 days vs. 7.4 P = 0.05 (OR 1.67)	30 day 26% vs. 16% Not significant	In hospital 7.5% vs. 2.3% Not significant

Hudson I. JPEN 2018;42(5):892-897 ; Mosquera C J Surg Research 2016;205:95.

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A New Approach to Defining Malnutrition

Consensus Statement

Consensus Statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition: Characteristics Recommended for the Identification and Documentation of Adult Malnutrition (Undernutrition)

Jane V. White, PhD, RD, FADA[1]; Peggi Guenter, PhD, RN[2]; Gordon Jensen, MD, PhD, FASPEN[3]; Ainsley Malone, MS, RD, CNSC[4]; Marsha Schofield, MS, RD[5]; the Academy Malnutrition Work Group; the A.S.P.E.N. Malnutrition Task Force; and the A.S.P.E.N. Board of Directors

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DOI: 10.1177/0148607112440285
http://jpen.sagepub.com
hosted at
http://online.sagepub.com

White J, et al., JPEN 2012; 36:275-283

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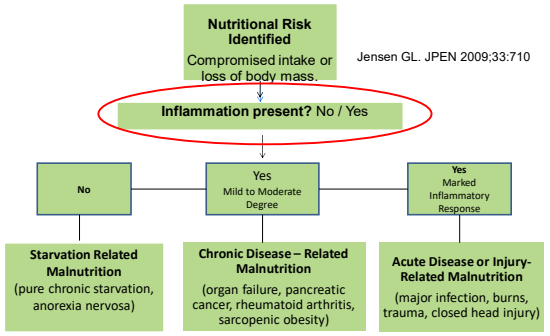
Etiology Based Malnutrition Definitions



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Consensus Malnutrition Characteristics

- Unintentional weight loss
- Evidence of inadequate intake
- Loss of muscle mass
- Loss of subcutaneous fat
- Fluid accumulation
- Reduced hand grip strength

The presence of two or more necessary for the diagnosis of malnutrition

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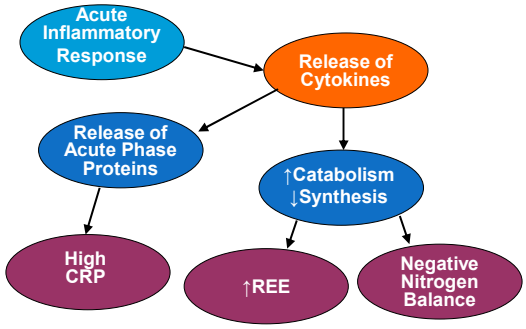
The Inflammatory Response - Acute



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Laboratory Parameters-Inflammation

- ↓'d serum albumin
- ↓'d serum transferrin
- ↓'d serum prealbumin
- Elevated C-reactive protein (↓'d in liver failure)
- Elevated blood glucose
- ↓'d or increased white blood cell count
- ↑'d percentage of neutrophils in the CBC
- ↓'d platelet count
- Marked negative nitrogen balance

Jevenn A. ASPEN. Adult Core Curriculum, 3rd ed 2017;185-212

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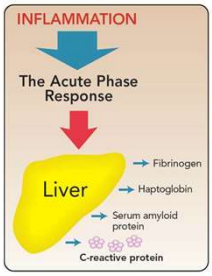
Inflammation and Protein Levels



C-Reactive Protein

- Major acute phase protein
- Effective measure of general inflammation
  - ✧ severity and duration

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Inflammatory Markers in Organ Failure

- ↑'d TNF, CRP, fibrinogin[1] and neutrophil/leukocyte ratio in COPD[2]
- ↑'d TNF, CRP and interleukin-6 in those with CHF[3]

[1] *JAMA* 2013;309:2353; [2] Inflammation 2013; Sept 28: epub;
[3] *J Am Coll Cardiol*. 2010;55:2129-37

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Clinical Parameters -Inflammation

- Fever
- Hypothermia
- Presence of infection
- Urinary tract infection
- Pneumonia
- Blood stream infection
- Wound or incisional infection
- Abscess

Jevenn A. ASPEN. Adult Core Curriculum, 3rd ed 2017;185-212

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Chronic Disease – Mild to Moderate Inflammatory Response

- Cardiovascular disease
- Celiac disease
- Chronic pancreatitis
- Chronic obstructive pulmonary disease
- Congestive heart failure
- Cystic fibrosis
- Dementia
- Diabetes mellitus
- Inflammatory bowel disease
- Hematologic malignancies
- Metabolic syndrome
- Neuromuscular disease
- Obesity
- Organ failure/transplant (kidney, liver, heart, lung or gut)
- Pressure wounds
- Rheumatoid arthritis
- Solid tumors

Jevenn A. ASPEN. Adult Core Curriculum, 3rd ed 2017;185-212

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Acute Disease/Injury – Severe Inflammatory Response

- Adult respiratory distress syndrome
- Closed head injury
- Critical illness
- Major abdominal surgery
- Major infection/sepsis
- Multi-trauma
- Systemic inflammatory response syndrome
- Severe burns
- Severe acute pancreatitis

Jensen G. A.S.P.E.N. Adult Core Curriculum, 3rd ed 2012

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Malnutrition Criteria

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Insufficient Energy Intake

- Review of food / nutrition intakes
- Obtain calculated / measured energy requirements
- Compare actual vs. requirements
- Report inadequacies as percent consumed over a period of time

Kondrup J. *Clin Nutr.* 2001;20:153-160

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Tools to Determine Intake Compared with Requirement

- Diet Intake
  - Directly from patient and/or family
  - Diet history/24 hour recall/3 day recall, etc
    - Less than half of your meals
    - Less than 75% of your meals
- Meal assessment – during hospitalization
  - Categorizes by %
    - 100, 75, 50, 25, 0
- Nutrition intervention during hospital course
- Estimating requirements
  - Indirect calorimetry
  - Energy equations (Mifflin St Jeor, Penn State, etc)

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Unintentional Weight Loss

- Unintended weight loss is a well-validated indicator of malnutrition
- Frequent weighing is preferred standard
- Factors that interfere with weight accuracy
  - Underlying disease state
  - Fluid status
  - Equipment malfunction / human error
  - Errors in recall

Jevenn A. ASPEN. Adult Core Curriculum, 3rd ed 2017;185-212

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Weight Loss

- Usual weight should be used to determine percent of weight loss over time
- Bed scale vs. standing measurement
- Follow weight patterns
- Estimate dry weight (consider height, previous history, intake status)

Blackburn, et al. *JPEN*. 1977;1:11-22. * Klein S, et al. *JPEN*. 1977;21:133-156. Rosenbaum K, et al. *JPEN*. 2000;24:52-55. * Keys A. *JAMA*. 1948;138:500-511.

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Loss of Subcutaneous Fat and Muscle

Tools to Determine Body Composition

- Anthropometric Measurements
  - skinfolds, circumference
- Bioelectrical impedance
- Dual-Energy X-ray Absorptiometry
- Physical Exam

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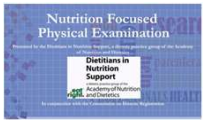
Nutrition-Focused Physical Exam

- Exam which uses physical assessment and physical function findings to help determine nutritional status and diagnose malnutrition
- Systematic approach (head-to-toe)
- Components
  - Use observation and palpation techniques
  - Confer findings with patient
- Academy has made the NFPE a standard of practice for RDs starting in 2012
- Academy NFPE workshops
- DNS NFPE video



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NFPE – Muscle and Fat Loss

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Physical Assessment - Fat

Exam Area	Tips	Severe Malnutrition	Mild-Moderate Malnutrition	Well Nourished
Subcutaneous Fat Loss				
Orbital Region	View patient when standing directly in front of them; touch above cheekbone	Hollow look, depressions, dark circles, loose skin	Slightly dark circles, somewhat hollow look	Slightly bulged fat pads. Fluid retention may mask loss
Upper Arm Region Triceps/Biceps	Arm bent, roll skin between fingers, do not include muscle in pinch	Very little space between folds, fingers touch	Some depth pinch but no ample	Ample fat tissue, obvious between folds of skin
Thoracic and Lumbar Region – Ribs, Lower Back, Midaxillary Line	Have patient press hands hard against a solid object	Depression between ribs very apparent Iliac crest very prominent	Ribs apparent, depressions between them less pronounced Iliac crest somewhat prominent	Chest is full; ribs do not show Slight to no protrusion of the iliac crest

The Academy of Nutrition and Dietetics, 2015, Nutrition Care Manual

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Physical Assessment - Muscle

Loss of Muscle Mass				
Exam Area	**Tips**	**Severe Malnutrition**	**Mild-Moderate Malnutrition**	**Well Nourished**
Temple - Temporalis Muscle	View patient when standing directly in front of them, ask patient to turn head side to side	Hollowing, scooping, depression	Slight depression	Can see/feel well defined muscle
Clavicle Bone Region – Pectoralis Major, Deltoid, Trapezius Muscles	Look for prominent bone. Make sure patient is not hunched forward	Protruding, prominent bone	Visible in male, some protrusion in female	Not visible in male, visible but not prominent in female
Clavicle and Acromion Process – Deltoid Muscle	Patient arms at side; observe shape	Shoulder to arm joint looks square. Bones prominent. Acromion protrusion very prominent	Acromion process may slightly protrude	Rounded, curves at arm/shoulder/ neck

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Exam Area	**Tips**	**Severe Malnutrition**	**Mild-Moderate Malnutrition**	**Well Nourished**
Scapular Bone Region – Trapezius,Supraspinus,Infraspinus Muscles	Ask patient to extend hands straight out, push against solid object	Prominent, visible bones, depression between ribs/scapula or shoulder/spine	Mild depression or bone may show slightly	Bones not prominent, no significant depressions
Dorsal Hand - Interosseous Muscle	Look at thumb side of hand; look at pads of thumb when tip of forefinger touching tip of thumb	Depressed area between thumb-forefinger	Slightly depressed	Muscle bulges, could be flat in some well nourished people
Patellar Region – Quadricep Muscle	Ask patient to sit with leg propped up bent at knee	Bones prominent, little sign of muscle around knee	Knee cap less prominent, more rounded	Muscles protrude, bones not prominent
Anterior Thigh Region - Quadriceps Muscles	Ask patient to sit, prop leg up. Grasp quads to differentiate muscle tissue from fat tissue	Depression/line on thigh, obviously thin	Mild depression on inner thigh	Well rounded, well developed
Post Calf Region – Gastrocnemius Muscle	Grasp the calf muscle to determine amount of tissue	Thin, minimal to no muscle definition	Not well developed	Well-developed bulb of muscle

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Assessing Fluid Accumulation

- Chart review-disease process
- Intake/Output records
- Weight
- Physical exam-edema
- Ascites-check history, imaging studies
- Masks body compartment assessment (fat, muscle, weight)
- Use with caution when determining degree of malnutrition!

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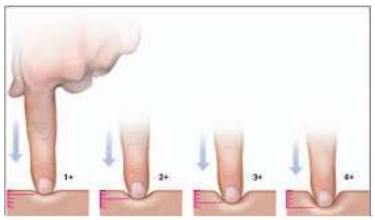
Assessment of Edema



http://www.med-health.net/Edema-Grading.html

ASSESSMENT OF PITTING EDEMA			
2mm or less = 1 + Edema	**2-4mm = 2 + Edema**	**4-6mm = 3 + Edema**	**6-8mm = 4 + Edema**
✓ Slight pitting ✓ No visible distortion ✓ Disappears rapidly	✓ Somewhat deeper pit ✓ No readably detectable distortion ✓ Disappears in 10-15 seconds (2-4 mm indent)	✓ Pit is noticeably deep ✓ May last more than 1 minute ✓ Dependent extremity looks fuller and swollen (4-6mm)	✓ Pit is very deep ✓ Lasts as long as 2-5 minutes ✓ Dependent extremity is grossly distorted (6-8mm)

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Functional Markers

- Overall energy, strength, endurance
- Consider non-malnutrition causes
  - neuromuscular diseases, medication, age-related, trauma, activity/immobility
- Correlate with other characteristics
- Ability to perform ADLs
- Ability to wean from mechanical ventilation
- Hand-grip strength – validated proxy for LBM[1]
- Independent predictor of poor nutrition status[2]

[1]Norman K et al. Clin Nutr 2011;30:135
[2]Flood A, et al. Clin Nutr 2014;33:106

Handgrip Strength Assessment course available online
https://store.dnsdpg.org/products/handgrip-strength-asssessment-a-skill-to-enhance-the-diagnosis-of-disease-related-malnutrition

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Application

Patient Cases

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Patient Presentation - CB

- 59 year old male admitted from the Emergency Department with acute rectal bleeding
- Colonoscopy on hospital day (HD) # 3 revealed a partially obstructing mid-rectal mass suspicious for malignancy.
- HD #6, the patient underwent a lower anterior resection (colon) with anastomosis.
- Nutrition Risk Assessment
  - Admission nutrition screen: Malnutrition Screening Tool Score: 0
  - RD monitored patient during admission and completed further assessment on HD #7 due to NPO status

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Patient Presentation - CB

Nutrition Presentation

- Anthropometrics
  - Height: 66 inches
  - Current weight: 263 #
  - Admission weight: 268 #
- Weight one months ago: 280# (per patient interview by RD)

Diet History

- NPO since admission
- Anorexia and reduced oral intake over last month – patient reported eating about half of his normal meal intake during same time period

Physical Assessment

- No evidence of subcutaneous fat or muscle loss
- Bilateral lower extremities: pitting edema: 2+

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Patient Presentation - CB

Clinical Data

- White blood cells: 16 K
- Temperature: 99.9 F
- Albumin: 1.8 g/dL
- Prealbumin: 7.8 mg/dL

Functional Status

- Physical Therapy evaluation: generalized weakness on admission

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What is Your Nutrition Diagnosis?

- *Weight loss:*
  - One month: 6%
- *Energy Intake*
  - No nutrient intake since hospital admission (seven days) – reduced intake over past month
- *Physical Assessment*
  - Moderate edema
- *Functional Assessment*
  - Generalized weakness – not part of current criteria

- **Severe malnutrition related to acute illness a/e/b weight loss, inadequate intake and fluid accumulation**

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Severe Malnutrition in Adults

J Acad Nutr Diet. 2012;112(5): 730-738

For Example: ICD-9 Code 262*	Acute Illness/Injury	Chronic Illness	Social/Environmental
Weight Loss	>2%/1 week >5%/1 month >7.5%/3 months	>5%/1 month >7.5%/3 months >10%/6 months > 20%/1 year	>5%/1 month >7.5%/3 months >10%/6 months > 20%/1 year
Energy Intake	≤ 50% for ≥ 5 days	≤ 75% for ≥ 1 month	≤ 50% for ≥ 1 month
Body Fat	Moderate Depletion	Severe Depletion	Severe Depletion
Muscle Mass	Moderate Depletion	Severe Depletion	Severe Depletion
Fluid Accumulation	Moderate → Severe	Severe	Severe
Grip Strength	Not Recommended in ICU	Reduced for Age/Gender	Reduced for Age/Gender

* 2012 ICD-9-CM Physician Volumes 1 and 2. American Medical Association

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Patient Presentation - JS

- 60 yr male diagnosed with laryngeal cancer
  - s/p radical laryngectomy with esophageal reconstruction and grafting
  - Received enteral feeding X 6 days in hospital
  - Discharged to home health care on oral diet
  - Proceeds with adjuvant chemo and radiation therapy (6 week course)
- Ht: 5'10", Current Wt: 140#, Usual Body Wt: 165#, BMI 20
- Nutrition history
  - Reduced eating pre-op X 1 month due to dysphagia
    - Improved following surgery
  - Profound eating difficulty following chemo/radiation
    - Consuming only bites and sips of food

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Patient Presentation - JS

- 25 # weight loss over past 3 months
  - 15% weight loss
- Physical Exam
  - Hollowed depression of temporal area
  - Visible clavicle
  - Very visible patella
  - No evidence of fluid accumulation
- Laboratory
  - Albumin: 2.8 g/dL

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What is Your Nutrition Diagnosis?

- *Weight loss:*
  - Three months:15%
- *Energy Intake*
  - Eating approximately half of normal food items over past month
- *Physical Assessment*
  - Severe loss of muscle and fat
- *Functional Assessment*
  - Generalized weakness – not part of current criteria

- Severe malnutrition related to chronic disease
  - a/e/b weight loss, inadequate intake and muscle loss

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Severe Malnutrition in Adults

J Acad Nutr Diet. 2012;112(5):730-738

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Muscle Mass	Moderate Depletion	Severe Depletion	Severe Depletion
Fluid Accumulation	Moderate → Severe	Severe	Severe
Grip Strength	Not Recommended in ICU	Reduced for Age/Gender	Reduced for Age/Gender

* 2012 ICD-9-CM Physician Volumes 1 and 2. American Medical Association

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Patient Presentation - SB

- HR is a 78 year old female admitted with abdominal pain
  - 1- month history of pain, nausea and vomiting
  - Long history of gastric dysfunction with previous gastric surgeries
  - Patient underwent partial gastrectomy with revision of roux-en-y gastrojejunostomy
    - J tube placement
- Provided with TPN for 2 weeks pre-op due to severe malnutrition
- Height: 64", Adm Weight: 98#
- Transitioned to EN 10 days post-op
- Ongoing EN intolerance issues with excessive stooling combined with nausea
  - Required 3-4 weeks to achieve goal maintenance energy requirements

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Patient Presentation - SB

- Ongoing issues with abdominal abscesses
- Nutrition assessment two months after admission
- Weight: 90#
  - 8% loss
- Physical Exam
  - Evidence of moderate to severe fat and muscle loss
    - Orbital fat loss
    - Prominent scooping of temporalis
    - Markedly visible clavicle and scapula
    - Very prominent patella
- Clinical Parameters
  - Normal WBC, afebrile, Albumin: 2.9 g/dL, Prealbumin 12 mg/dL

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What is Your Nutrition Diagnosis?

- *Weight loss:*
  - 2 months: 8%
- *Energy Intake*
  - RD monitoring reports avg of 80%-90% of energy/protein requirements over past month
- *Physical Assessment*
  - Severe loss of muscle and fat
- *Functional Assessment*
  - Generalized weakness – not part of current criteria

- Severe malnutrition related to chronic disease
  - a/e/b weight loss and fat/muscle loss

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Severe Malnutrition in Adults

J Acad Nutr Diet. 2012;112(5):730-738

For Example: ICD-9 Code 262*	Acute Illness/Injury	Chronic Illness	Social/Environmental
Weight Loss	>2%/1 week >5%/1 month >7.5%/3 months	>5%/1 month >7.5%/3 months >10%/6 months > 20%/1 year	>5%/1 month >7.5%/3 months >10%/6 months > 20%/1 year
Energy Intake	≤ 50% for ≥ 5 days	≤ 75% for ≥ 1 month	≤ 50% for ≥ 1 month
Body Fat	Moderate Depletion	Severe Depletion	Severe Depletion
Muscle Mass	Moderate Depletion	Severe Depletion	Severe Depletion
Fluid Accumulation	Moderate → Severe	Severe	Severe
Grip Strength	Not Recommended in ICU	Reduced for Age/Gender	Reduced for Age/Gender

* 2012 ICD-9-CM Physician Volumes 1 and 2. American Medical Association

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Feasibility and Usability Evaluation

- Nicolo M, et al, 2013
- Goals
  - Which criteria would be available at first nutrition assessment
  - Prevalence of severe and non-severe malnutrition
  - Determine patients considered by clinicians to be "at risk" for developing malnutrition
    - not meeting diagnostic criteria
- 101 consecutive patient referrals
  - 73 non ICU
  - 28 ICU

JPEN 2012:36:275-283; *JPEN* 2013onlineDec3

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Feasibility and Usability Evaluation

- Nicolo M, et al, 2013
  - Two participating facilities (n=163)
    - Patients referred to RD for assessment
    - Patients consulted for nutrition support

Table 5. Prevalence of Malnutrition Using Academy of Nutrition and Dietetics–American Society for Parenteral and Enteral Nutrition Recommended Clinical Characteristics.[6]

Group	Not Malnourished With Acute Illness	Moderate Malnutrition With Acute Illness	Severe Malnutrition With Acute Illness	Not Malnourished With Chronic Illness	Moderate Malnutrition With Chronic Illness	Severe Malnutrition With Chronic Illness	Moderate Malnutrition With Social-Environmental Circumstances	Severe Malnutrition With Social-Environmental Circumstances
Total	73 (27.8)	17 (6.5)	20 (7.6)	79 (30.0)	32 (12.2)	29 (11.0)	2 (0.8)	1 (0.4)
HUP	21 (20.8)	4 (4.0)	3 (3.0)	42 (41.6)	13 (12.9)	16 (15.8)	1 (1.0)	1 (1.0)
GMC	52 (71.2)	13 (8.6)	17 (11.2)	37 (24.3)	19 (12.5)	13 (8.6)	1 (0.7)	0
Non-ICU	0	0	2 (1.4)	79 (55.6)	30 (21.1)	28 (19.7)	2 (1.4)	1 (0.7)
ICU	73 (67.6)	17 (15.7)	18 (16.7)	0	0	0	0	0

Data are number (percentage). GMC, Geisinger Medical Center; HUP, Hospital of the University of Pennsylvania; ICU, intensive care unit.

JPEN 2012:36:275-283; *JPEN* 2013onlineDec3

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Feasibility and Usability Evaluation

Malnutrition Data

Variable	Entire Group (n=101)	Non-ICU (n=73)	ICU (n=28)
Energy Intake < 50% usual	71 (31%)	19 (33%)	3 (21%)
Energy Intake > 50% usual	49 (69%)	38 (66.7%)	11 (78.5%)
No Weight Loss	37 (46%)	29 (43%)	8 (68%)
1-5% Weight Loss	5 (6%)	3 (4%)	2 (7%)
6-10% Weight Loss	37 (46%)	28 (40%)	9 (32%)
Loss of Fat Mass	27 (25%)	19 (28%)	5 (18%)
No Loss of Fat Mass	73 (75%)	50 (72%)	23 (82%)
Loss of Muscle Mass	33 (34%)	28 (41%)	5 (18%)
No Loss of Muscle Mass	63 (66%)	40 (59%)	23 (82%)
Edema	29 (32%)	28 (41%)	12 (46%)
No Edema	62 (68%)	48 (74%)	14 (54%)

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Use of Academy/ASPEN Malnutrition Characteristics

- 2012 ASPEN Nutrition Screening and Assessment Survey
  - 34% in implementation process; 40% within one year
- ASPEN survey 2016 (n=649)
  - 87% of all respondents reported use of Academy/ASPEN tool
- Dietitians in Nutrition Support 2016 survey (n=652)
  - 94% of all respondents reported use of Academy/ASPEN tool
- Academy survey 2014 and 2017
  - "Clinical" and "nutrition support" practice
  - Use of Academy/ASPEN tool increased from 57% to 71% (p<0.001)

Patel V. Nutr Clin Pract 2014; 29:483; Mogensen K, Nutr Clin Pract; 2018;33:711.; Dobak S. J Acad Nutr Diet 2018;118:978; Mordarski B, J Acad Nutr Diet 2019; 119:310

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Additional Practice Points

- Requires more extensive clinical review/intervention
  - Review of medical record
  - Patient/family interview
  - Physical assessment
  - 30-60 minutes
  - Verbal communication with MD
    - Especially when EN/PN is most likely intervention
- Positive benefit in shared decision making
  - Opportunity in patient education on nutrition status

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To Summarize

- Incorporating the Academy/ASPEN Consensus will standardize diagnosis/documentation of malnutrition
  - Key step for determining national prevalence and designing intervention research
- Evaluating the presence and degree of inflammation is essential
- Provided key points for evaluating the 6 malnutrition characteristics
- Application via patient case discussion

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Thank You!
Questions?

Nutrition-related resources and tools are available from Nestlé Nutrition Institute: nestlenutrition-institute.org

Visit MyCE at MyCEeducation.com Offering CE to dietitians and nurses

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