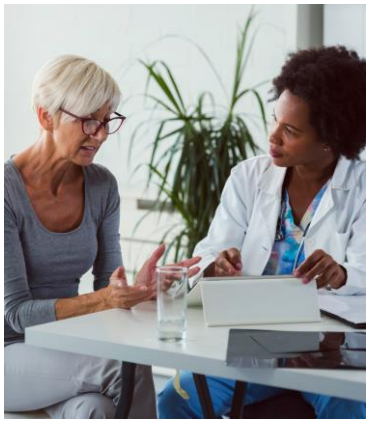
Sharpen Your Edge: Integrating NFPE & Lab Assessment



Live Webinar: Thursday April 13, 2023 (2:00-3:00pm EDT)
Convert to your own time zone

Brought to you with the generous support of

HORMEL HEALTH LABS

Description and Speaker:

Join award winning dietitian, Dr. Mary Litchford, PhD, RDN, LDN to refresh and refine your clinical reasoning skills in lab assessment and interpretation of nutrition focused physical exam findings. Learn practical strategies to integrate foundational dietetics knowledge in clinical assessment to diagnose nutrition problems which can be resolved or improved through treatment or nutrition intervention.

Objectives:

After completing this continuing education course, the learner should be able to:

1. Analyze relationships between nutrition status indicators and changes in overall health.
2. Incorporate nutrition focused physical exam (NFPE) and lab assessment to identify potential nutrient deficiencies or toxicities associated with changes in skin, hair and nails, HEENT, upper torso, abdomen, and musculoskeletal system using NFPE.
3. Integrates foundational dietetics knowledge with critical appraisal of assessment data to diagnose nutrition problems, which can be resolved or improved through treatment or nutrition intervention.

Disclosure:

Dr. Litchford discloses that she is a paid presenter on this topic for Abbott Labs and Nestle Nutrition, however, she certifies that no conflict of interest exists for this program.

Professional Approvals:

Becky Dorner & Associates, Inc. has been providing continuing professional education (CPE) since 1983 (Commission on Dietetic Registration provider number NU004).

Intended Audience: RDNs and NDTRs	**CDR Activity Type and Number:** Activity Type: 171 Live webinar/175 Recorded Activity number: 175163 Recorded Webinar: 175164
CPE Hours: 1.0	**CDR Level:** II
Suggested CDR Performance Indicators: 4.2.5, 4.2.6, 10.2.4	

Note: Numerous Other Performance Indicators May Apply.

Expiration Date for Recorded Webinar: March 13, 2026.

How to Complete a CPE Course:

https://www.beckydorner.com/continuing-education/how-to-complete-cpe/

Questions? Please contact us at info@beckydorner.com

Sharpen Your Edge: Integrating NFPE & Lab Assessment

Today's Webinar
Please refer to your handout for instructions

Handouts
Live: Emailed to the person who registered for the program, and posted in the Go To Webinar System

Recording
Available on our website with the recording

Questions
Live: Use GoToWebinar to ask questions
Recording: Email info@beckydorner.com

Program Length
60 minutes

Credit Hours/Certificate
Please refer to handouts for details

1

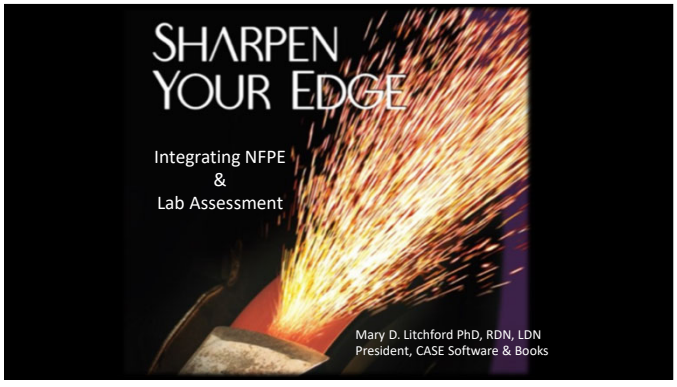
Mary D. Litchford PhD, RDN, LDN

Disclosures
Consultant to Prosynthesis Labs and President, Case Software and Books
However, there are no conflicts of interest for this webinar

- National speaker, author, medical-legal expert, consultant to HC providers
- President, CASE Software & Books
- Past President of National Pressure Injury Advisory Panel(only the 2nd RDN to ever hold this prestigious position)
- NPIAP representative to the 2019 Guideline Governance Group (1st RDN to serve on this group)
- Author of cutting-edge reference books with CE options including:
  - *Sharpen Your Edge in Nutrition Focused Physical Exams*
  - *Nutrition & Pressure Injuries*
- Author of cutting-edge reference books
  - *Laboratory Assessment of Nutritional Status: Bridging Theory & Practice*

Available at www.beckydorner.com

2



3

Objectives

At the completion of the course successful learners will be able to:

- Analyze relationships between nutrition status indicators and changes in overall health.
- Incorporate NFPE and lab assessment to identify potential nutrient deficiencies or toxicities associated with changes in skin, hair and nails, HEENT, upper torso, abdomen, and musculoskeletal system using NFPE.
- Integrates foundational dietetics knowledge with critical appraisal of assessment data to diagnose nutrition problems, which can be resolved or improved through treatment or nutrition intervention.

4

Is Poor Diet an Equal Opportunity Killer?

"Worldwide in 2017, poor diet was linked to 11 million deaths."

Dr. Ashkan Afshin

GBD 2017 Diet Collaborators. *The Lancet*. 3 April 2019
Miller,V et al. Lancet Planet Health 2020; 4: e352–70.
DOI:https://doi.org/10.1016/S2542-5196(20)30162-5

5

Self Assessment

What aspects of NFPE are you using presently?

- Validated Health & Nutrition screening tools?
  - Malnutrition?
  - Sarcopenia or frailty?
  - Dysphagia?
- Characteristics of adult malnutrition (Academy or GLIM)?
- Characteristics of pediatric malnutrition (ASPEN)?
- Assess for oral health and swallowing?
- Medication-micronutrient deficiency evaluation?
- Full head to toe NFPE
- Focused NFPE driven by labs and medications

6

Screening Tools for Malnutrition

Malnutrition Screening Tools	Criteria Used
Malnutrition Screen Tool (MST) http://static.abbottnutrition.com/cms-prod/abbottnutrition.com/img/Malnutrition%20Screening%20Tool_FINAL.pdf	Unplanned weight loss Appetite
Nutrition Risk Screen-2002 https://www.mdcalc.com/nutrition-risk-screening-2002-nrs-2002	Unplanned weight loss, BMI, Age, Disease severity, Impaired physical condition
Malnutrition Universal Screen Tool(MUST) http://www.bapen.org.uk/pdfs/must/must_full.pdf	Unplanned weight loss, BMI, Disease severity, Food intake
Mini Nutrition Assessment (MNA) http://mna-elderly.com/default.html	Appetite, GI issues, Unplanned weight loss, BMI, Mobility, Stress
Short Nutrition Assessment Questionnaire (SNAQ) http://www.fightmalnutrition.eu/toolkits/summary-screening-tools	Unplanned weight loss, Appetite, Intake of supplemental drinks or tubefeeding
Seniors in the Community: Risk Evaluation for Eating and Nutrition (SCREEN II) https://www.researchgate.net/publication/257790956_Validation_of_the_nutrition_screening_tool_%27Seniors_in_the_Community_Risk_Evaluation_for_Eating_and_Nutrition_version_II%27_among_octogenarians	Unplanned weight loss, Appetite, Intake, Impaired physical condition (difficulty chewing, swallowing, shopping, cooking)
Canadian Nutritional Screening https://journals.lww.com/aswcjournal/Fulltext/2017/02000/The_Canadian_Nutrition_Screening_Tool.4.aspx	Unplanned weight loss without regain Food intake

7

Selected Sarcopenia Screening Tools

Scale	Description	Reference
SARC-F	5 point screening tool- strength, walking, rising from chair, climbing stairs, fall history	Malmstrom TK,et al. JCSM. 2016 Mar;7(1):28-36 https://pubmed.ncbi.nlm.nih.gov/27066316/
SARC-CalF	SARC-F plus calf circumference	Bahat, G et al. J Nutr Health Aging 2018. 22, 1034–1038. https://doi.org/10.1007/s12603-018-1072-y
FRAIL Scale	Weighted 5 point scale- fatigue, ability to climb steps, ability to walk a given distance, history of illness, loss of weight	Woo, J et al. JAGS. 2012. 60(8). 1478-86
R-MAPP	MUST and SARC-F questionnaires to classify risk of malnutrition, sarcopenia and poor outcomes	Krznaric,Z, et al. Clinical Nutrition. 2020. DOI:https://doi.org/10.1016/j.clnu.2020.05.006

8

EAT-10 Eating Assessment Tool

Questions	Questions
1. My swallowing problem has caused me to lose weight.	6. Swallowing is painful.
2. My swallowing problem interferes with my ability to go out for meals.	7. The pleasure of eating is affected by my swallowing.
3. Swallowing liquids takes extra effort.	8. When I swallow food sticks in my throat
4. Swallowing solids takes extra effort.	9. I cough when I eat.
5. Swallowing pills takes extra effort	10. Swallowing is stressful.

Each question rates the severity of swallowing difficulties from 0-4; total score 40.

Total Score of 3 or high suggests oropharyngeal dysphagia.

Score of 15 or high indicates > 2 x higher likelihood of aspiration.

Belafsky PC, Ann Otol Rhinol Laryngol 117: 919-924, 2008

9

Academy/ASPEN Characteristics of Moderate Malnutrition

Characteristic	Acute Illness/Injury	Chronic Illness	Social/Environmental
1. Insufficient Energy Intake	< 75% for > 7 days	< 75% for > or = to 1 mo	< 75% for > or = to 3 mos
2. Interpretation of Weight Loss	1-2%/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
3. Changes in Body Composition: Loss of Body Fat	Mild depletion	Mild depletion	Mild depletion
4. Changes in Body Composition: Loss of Muscle Mass	Mild depletion	Mild depletion	Mild depletion
5. Changes in Body Composition: Accumulation of Fluid	Mild	Mild	Mild
6. Grip Strength	Not Applicable	Not Applicable	Not Applicable

Adapted from and used with permission White, J. 2012.

10

Academy/ASPEN Characteristics of Severe Malnutrition

Characteristic	Acute Illness/Injury	Chronic Illness	Social/Environmental
1. Insufficient Energy Intake	< 50% for > 5 days	< 75% for > or = to 1 mo	< 50% for > 1 mos
2. Interpretation of 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
3. Changes in Body Composition: Loss of Body Fat	Moderate depletion	Severe depletion	Severe depletion
4. Changes in Body Composition: Loss of Muscle Mass	Moderate depletion	Severe depletion	Severe depletion
5. Changes in Body Composition: Accumulation of Fluid	Moderate to Severe	Severe	Severe
6. Grip Strength	Markedly reduced	Markedly reduced	Markedly reduced

Adapted from and used with permission White, J. 2012.

11

GLIM Criterion for Diagnosis of Adult Malnutrition

Phenotypic Criteria	Interpretation	Etiologic Criteria	Interpretation
Weight loss (%)	> 5% within past 6 mos	**Reduced Food Intake or Assimilation**	≤ 50% estimated energy requirement for > 1 wk **Or** Any reduction for > 2 wks **Or** any chronic GI condition that adversely impacts food assimilation
Low BMI	< 20 if < 70 yrs < 22 if > 70 yrs **Asia:** <18.5 if < 70 yrs < 20 if > 70 yrs	**Inflammation**	Acute disease/injury related **Or** Chronic disease related
Reduced Muscle Mass	Measured by validated body composition measuring techniques		

Adapted from Cederholm, 2019. Open access

12

GLIM Phenotypic Criterion For Severity of Adult Malnutrition

Phenotypic Criteria	Moderate	Severe
Weight loss (%)	> 5% within past 6 mos **Or** 10-20% beyond 6 mos	> 10% within past 6 mos **Or** > 20% beyond 6 mos
Low BMI	< 20 if < 70 yrs **Or** < 22 if > 70 yrs **Asia:** <18.5 if < 70 yrs **Or** < 20 if > 70 yrs	<18.5 if < 70 yrs **Or** < 20 if > 70 yrs
Reduced Muscle Mass	Mild to moderate loss as measured by validated methods	Severe loss as measured by validated methods

Adapted from Cederholm, 2019. Open access

13

Poll 1: Assessment of Body Composition

What methodology do you use to assess body composition?

A. I don't assess body composition.
B. Digital anthropometry
C. DXA or CT scans
D. BIA or ultrasound

14

Macronutrient & Micronutrient Assessment

Macronutrient Assessment	Micronutrient Assessment
• Signs from NFPE	• Signs from NFPE
• Symptoms from client history and screening data	• Symptoms from client history and screening data
• Anthropometric data	• Lab & diagnostic test results
• Lab & diagnostic test results for malabsorption of carbohydrates and fat • Albumin and prealbumin are NOT measures of protein malnutrition	• Medication history

Litchford, M Sharpen Your Edge in NFPE, 2023.
Litchford, M. "Drug-Nutrient Interactions" in *Integrative & Functional MNT: Principles & Practices*, 2020
Litchford, M Lab Assessment Nutritional Status, 2017

15

Vitamin Deficiencies, Toxicities, Meds & Labs

Vitamins	Vitamin A	Vitamin D
S/S Deficiency	Impaired night vision, chronic dry eye, Bitot's spots, follicular hyperkeratosis	Muscular weakness, bone pain, osteomalacia; In children, rickets, knock knees, fontal bossing
Meds that May Promote Deficiency	Bile Acid sequestrants Laxatives	Anticonvulsants Antitubercular Bile Acid sequestrants Immunosuppressant Laxatives
Labs associated with micronutrient deficiency	↓ Serum Retinol (toxicity ↑ Serum Retinol)	↓ Serum 25(OH)D (toxicity ↑ Serum 25(OH)D, hyperlipidemia, hypercalcemia)

Litchford, M Sharpen Your Edge in NFPE, 2023.
Litchford, M. "Drug-Nutrient Interactions" in *Integrative & Functional MNT Principles & Practices*, 2020
Litchford, M Lab Assessment Nutritional Status, 2017

16

Vitamin Deficiencies, Toxicities, Meds & Labs

Minerals	Vitamin K	Vitamin E
S/S Deficiency	Petechiae, purpura	Peripheral neuropathy, ataxia, skeletal myopathy, retinopathy, impaired immune response
Meds that May Promote Deficiency	Antibiotics Anticonvulsants Bile Acid sequestrants Laxatives	Bile Acid sequestrants Laxatives
Labs associated with micronutrient deficiency	↓ Serum Vitamin K ↑ PT and INR Normal D-dimer & partial thromboplastin time (PTT)	↓ Serum α–tocopherol ↓ α–tocopherol to total plasms lipids

Litchford, M Sharpen Your Edge in NFPE, 2023.
Litchford, M. "Drug-Nutrient Interactions" in *Integrative & Functional MNT Principles & Practices*, 2020
Litchford, M Lab Assessment Nutritional Status, 2017

17

Vitamin Deficiencies, Toxicities, Meds & Labs

Vitamins	Thiamine	Niacin	Riboflavin
S/S Deficiency	Cheilosis, angular stomatitis, paresthesia of extremities, anorexia, memory loss	Diarrhea, anorexia, dermatitis, glossitis, beefy red tongue, dementia	Cheilosis, fissuring of the lips, sore, red tongue, oily, scaly skin rashes on the scrotum, vulva, & philtrum
Meds that May Promote Deficiency	Alcohol	Isoniazid Ethionamide 6-mercaptopurine Estrogens 5-fluoroacil	Anticholinergics Anticonvulsants Phenothiazines Phenytoin
Labs associated with micronutrient deficiency	↓ Whole blood or erythrocyte thiamine ↓ Erythrocyte transketolase activity ↑ Pyruvate levels ↓ Folate ↓ Urinary thiamine excretion	↓ Urinary excretion of N^1-Methylnicotinamide	↓ Riboflavin, serum, plasma ↑ Erythrocyte glutathione reductase activity ↓ Hemoglobin ↓ Hematocrit MCV WNL

Litchford, M Sharpen Your Edge in NFPE, 2023.
Litchford, M. "Drug-Nutrient Interactions" in *Integrative & Functional MNT Principles & Practices*, 2020
Litchford, M Lab Assessment Nutritional Status, 2017

18

Vitamin Deficiencies, Toxicities, Meds & Labs

Vitamins	Vitamin B6	Vitamin C
S/S Deficiency	Pale conjunctiva, angular stomatitis, glossitis, peripheral neuropathy with weakness, diarrhea, paresthesia, gingivitis	Pallor, gingivitis, poor wound healing, follicular hyperkeratosis, petechiae, purpura
Meds that May Promote Deficiency	Cycloserine Hydralazine Isoniazid D-penicillamine Pyrazinamide	Oral contraceptives Smoking (Nicotine)
Labs associated with micronutrient deficiency	↓ Vitamin B6	↓ Plasma or leukocyte ascorbate

Litchford, M Sharpen Your Edge in NFPE, 2023.
Litchford, M. "Drug-Nutrient Interactions" in *Integrative & Functional MNT Principles & Practices*, 2020
Litchford, M Lab Assessment Nutritional Status, 2017

19

Vitamin Deficiencies, Toxicities, Meds & Labs

Vitamins	Vitamin B12	Folate
S/S Deficiency	Yellow tinted skin, angular stomatitis, glossitis, fatigue, weakness, cognitive changes, paresthesia	Pale conjunctiva, pallor, glossitis, gingivitis, fatigue, weakness, cognitive changes irritability, anorexia
Meds that May Promote Deficiency	Antacids, PPI Antibiotics Antihyperglycemics Antiplatelet agents Antigout	Antacids, PPI Antibiotics Antineoplastic Antiplatelet Agents Bile Acid sequestrants
Labs associated with micronutrient deficiency	↓ Hemoglobin/Hematocrit ↑ MCV ↑ Ferritin ↓ Serum B12 ↑ Or WNL Folate ↑ Methylmalonic acid (blood or urine)	↓ Hemoglobin ↓ Hematocrit ↑ MCV ↑ Ferritin ↓ Serum and RBC folate WNL Methylmalonic acid (blood or urine)

Litchford, M Sharpen Your Edge in NFPE, 2023.
Litchford, M. "Drug-Nutrient Interactions" in *Integrative & Functional MNT Principles & Practices*, 2020
Litchford, M Lab Assessment Nutritional Status, 2017

20

Mineral Deficiencies, Toxicities, Meds & Labs

Minerals	Iron	Zinc
S/S Deficiency	Thinning hair, pale conjunctiva, pallor, glossitis, koilonychia, central ridges on nails, fatigue, weakness	Thinning hair, gingivitis, hypogeusia, dysgeusia, poor wound healing
Meds that May Promote Deficiency	Anticonvulsants Antihypertensives Antitubercular Beta-blockers Bronchodilators Estrogen replacement	Antacids, PPI Antibiotics Antineoplastic Antiplatelet Agents Bile Acid sequestrants
Labs associated with micronutrient deficiency	↓ Hemoglobin, ↓ Hematocrit, ↓ Or WNL MCV, ↓ Serum Fe, ↓ Ferritin, ↑ TIBC, ↑ Reticulocyte Count	↓ Serum Zinc, ↑ Urinary Zinc excretion (toxicity ↓ copper, anemias that don't respond to Fe, FA, B12, B6; wound dehiscence)

Litchford, M Sharpen Your Edge in NFPE, 2023.
Litchford, M. "Drug-Nutrient Interactions" in *Integrative & Functional MNT Principles & Practices*, 2020
Litchford, M Lab Assessment Nutritional Status, 2017

21

Mineral Deficiencies, Toxicities, Meds & Labs

Minerals	Sodium	Magnesium
S/S Deficiency	Confusion, disorientation, nausea, vomiting, fatigue, restlessness, irritability, muscle weakness, seizures, coma, edema	Anorexia, nausea, vomiting, fatigue, weakness, numbness, tingling, muscle contractions and cramps, cardiac arrhythmias, personality changes
Meds that May Promote Deficiency	Antihypertensives (RAAS) Antimanic Antiplatelet agents Diuretics	Antacids, PPI Antibiotics Beta-2 agonists Diuretics Immunosuppressant
Labs associated with micronutrient deficiency	↓ Serum Sodium ↓ Urine Sodium non-renal etiology ↑ Urinary Sodium if renal etiology If edema/anasarca is present all labs lower than expected d/t dilution. (toxicity- hypernatremia)	↓ Serum Magnesium (toxicity- ↑ Serum Magnesium nausea, vomiting, fatigue, can lead to coma and cardiac arrest)

Litchford, M Sharpen Your Edge in NFPE, 2023.
Litchford, M. "Drug-Nutrient Interactions" in *Integrative & Functional MNT Principles & Practices*, 2020
Litchford, M Lab Assessment Nutritional Status, 2017

22

Mineral Deficiencies, Toxicities, Meds & Labs

Minerals	Potassium
S/S Deficiency	Weakness, fatigue, muscle cramps and spasms, cardiac arrhythmias, constipation
Meds that May Promote Deficiency	ACEI, ARBS Antiplatelet agents Beta-blockers Beta-2 agonists Bronchodilators Diuretics Laxatives
Labs associated with micronutrient deficiency	↓ Serum Potassium ↓ Urine Potassium for non-renal etiology (GI loss, diet) ↓↓ Urine Potassium for renal etiology (toxicity- hyperkalemia)

Litchford, M Sharpen Your Edge in NFPE, 2023.
Litchford, M. "Drug-Nutrient Interactions" in *Integrative & Functional MNT Principles & Practices*, 2020
Litchford, M Lab Assessment Nutritional Status, 2017

23

Practical Applications: Case 1 in Urgent Care(uc)

Questions to ponder as we look at Case 1.

Do you note any nutrition related issues?

24

Practical Applications: Case 1 in Urgent Care(UC)

8/17 AB sustained a fracture of right ulna, cuts and bruises on right side of face, knees, hands due to fall while hiking in state park. C/O of pain in left leg while walking. Clothing is covered in dirt/sand from fall. He is confused and agitated. His skin is dry and scaly, nails appeared bitten/chewed, flat and ridged.

Admit Data: 37 yr old M, Afro-Asian ethnicity, 165 cm, 45 kg, HR 110, BP 88/55

Meds: mirtazapine(depression & insomnia), lansoprazole (GERD), sumatriptan (migraines)

Medical Hx: Hx of depression, insomnia, migraines, seizures, peptic ulcers & weight loss.

Social Hx: Grad student in engineering, no family in USA. Friend drove him to hospital. Witness reports AB passed out while hiking. AB has no memory of feeling faint or falling. AB works part-time and attends grad school fulltime.

Food Hx: Eats 1-2 meals/d, mainly take-out. Prefers vegan options. Intake today: green tea, rice cake. He has not eaten since early morning. He didn't take a water or snack with him on hike.

25

Practical Applications: Case 1 in UC

Component in Blood	Standard Range	Ordered in UC 8/17 (NF)
SODIUM	135-146 mEq/L; 135 - 146 mmol/L	146 mmol/L
POTASSIUM	3.5 - 5.0 mEq/L; 3.5 - 5.0 mmol/L	3.7 mmol/L
CHLORIDE	98 – 106 mEq/L; 98 - 106 mmol/L	109 mmol/L
BUN	10.0 - 20.0 mg/L; 3.6-7.1 mmol/L	10.7 mmol/L
GLUCOSE	70 - 99 mg/L; 3.9-6.0 mmol/L	8.9 mmol/L
CREATININE M	0.6 - 1.2 mg/L;53-106 μmol/L	53 μmol/L
ALBUMIN	3.5 - 5.0 g/dL; 35-50 g/L	39 g/L
HEMOGLOBIN M	14-18 g/dL; 8.7-11.2 mmol/L	6.5 mmol/L
HEMATOCRIT M	42%-52%; 0.42-0.52	0.33
MCV	81.0 - 95.0 μm^3 ; 81.0 - 95.0 fL	99 fL

26

Poll 2: Case 1 in UC

What is your initial assessment of AB's nutrition and overall health status?

A. Active, healthy graduate student, no nutrition issues
B. Underweight, undernourished adult, with poor quality diet
C. Normal weight adult with micronutrient toxicities
D. Sedentary, graduate student at risk of type 2 diabetes

27

Practical Applications: Case 1 in UC

Make a list of the nutrition related issues you observe from the data provided.

Make a 2nd list of additional information you would like for a comprehensive nutrition assessment.

28

Practical Applications: Case 1 in UC

Based on data provided, what evidence do you observe that might suggest a nutrition related problem?

AB sustained a fracture of right ulna, cuts and bruises on right side of face, knees, hands due to fall while hiking in state park. C/O of pain in left leg while walking. Clothing is covered in dirt/sand from fall. He is confused and agitated. His skin is dry and scaly…
Admit Data: 37 yr old M, Afro-Asian ethnicity, 165 cm, 45 kg, HR 110, BP 88/55

Observations:
Physiological stress from injuries. ↑ Glu

? Dehydration. ↑ HR, ↓ BP, Confused and agitated following hike on hot day; dry scaling skin- check labs for ↑ Na, Cl, BUN; expect Glu and Alb to be elevated too.

29

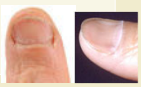
Practical Applications: Case 1 in UC

Based on data provided, what evidence do you observe that might suggest a nutrition related problem?

Nails appeared bitten/chewed, flat and ridged.
Admit Data: 37 yr old M, Afro-Asian ethnicity, 165 cm, 45 kg
Meds: mirtazapine(depression & insomnia), lansoprazole (GERD), sumatriptan (migraines)
Medical Hx: Hx of migraines, seizures, peptic ulcers and weight loss in last 6 months.
Social Hx: Grad student in engineering, no family in USA. AB works part-time and attends grad school fulltime.

Observations:
? Nutritional anemia, nails flat and ridged, takes PPI that may promote loss of B12, zinc. Hx peptic ulcers, weight loss; stressful, heavy workload and no local family support

? Malnutrition BMI 16.5



30

Practical Applications: Case 1 in UC

Based on food & nutrition data provided, what evidence do you observe that might suggest a nutrition related problem?

Food Hx: Eats 1-2 meals/d, mainly take out. Prefers vegan options. Intake today: green tea, rice cake. He has not eaten since early morning. He didn't take a water or a snack with him on hike.

Observations:
? Malnutrition related to poor diet and dehydration
? Self-neglect or lack of nutrition knowledge
? Nutrition insecurity

31

Practical Applications: Case 1 in UC

Component in Blood	Standard Range	Labs ordered UC 8/17 (NF)
SODIUM	135-146 mEq/L; 135 - 146 mmol/L	146 mmol/L ↑
POTASSIUM	3.5 - 5.0 mEq/L; 3.5 - 5.0 mmol/L	3.7 mmol/L
CHLORIDE	98 – 106 mEq/L; 98 - 106 mmol/L	109 mmol/L ↑
BUN	10.0 - 20.0 mg/L; 3.6-7.1 mmol/L	10.7 mmol/L ↑
GLUCOSE	70 - 99 mg/L; 3.9-6.0 mmol/L	8.9 mmol/L ↑
CREATININE M	0.6 - 1.2 mg/L;53-106 μmol/L	53 μmol/L
ALBUMIN	3.5 - 5.0 g/dL; 35-50 g/L	39 g/L ↑
HEMOGLOBIN M	14-18 g/dL; 8.7-11.2 mmol/L	6.5 mmol/L ↓
HEMATOCRIT M	42%-52%; 0.42-0.52	0.33 ↓
MCV	81.0 - 95.0 μm^3 ; 81.0 - 95.0 fL	99 fL ↑

32

Practical Applications: Case 1 Follow Up

AB's injuries are treated, and he is discharged. Referred to university based RDN for nutrition counseling. He agrees to see the RDN however, he misses his appointment.

The university health clinic follows up and learns AB has a URI and is attending class online. AB agrees to see the RDN the following week 9/16 (~ 30 days after the fall hiking). He completed and submitted the patient-generated subjective global assessment form and food recall online 9/15.

Clinic data measured 9/16: ht 165 cm, wt 41 kg, HR 89, BP 145/95

33

Practical Applications: AB Food Recall(9/15)

Time	Food Item and Method of Preparation	Amount Eaten	Where
0600	Green Tea- 500 mL	all	home
	2 Dates, ½ pita bread, 1 tbs hummus	all	home
0800	Energy Drink 500 mL	all	school
1500	Noodles with vegetables, tofu 250-500 mL	all	school
	Flat bread 1-servings	half	school
	Energy drink- 600 mL	all	school
	Sorbet 125-200 mL	all	school
2100	Mixed vegetables and rice 100-150 gm	half	home
	Pita bread 1-serving	all	home
	Drinks water, tea or energy soft drinks throughout the day	Beverages are not allowed at work	

34

Practical Applications: PG-SGA (9/15)

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)]

Patient Identification Information AB

1. Weight *(See Worksheet 1)*

In summary of my current and recent weight:

I currently weigh about 42 kg
I am about 165 cm tall

One month ago I weighed about 45 kg
Six months ago I weighed about ?50.52 kg not sure- don't have a scale

During the past two weeks my weight has:
☒ decreased (1) ☐ not changed (0) ☐ increased (0)

Box 1 1

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) Box 2 2

https://pt-global.org/wp-content/uploads/2016/07/PG-SGA-Metric-version-3.22.15-std-logo.pdf

35

Practical Applications: PG-SGA (9/15)

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)** depressed, stressed
**Examples: depression, money, or dental problems Box 3 5

☐ vomiting (3)
☐ diarrhea (3)
☐ dry mouth (1)
☐ smells bother me (1)
☐ feel full quickly (1)
☒ fatigue (1)

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) recovering from fall
☐ 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)

Box 4 4

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

Additive Score of Boxes 1-4 0 A

email: faithotterymdphd@gmail.com or info@pt-global.org

https://pt-global.org/wp-content/uploads/2016/07/PG-SGA-Metric-version-3.22.15-std-logo.pdf

36

Practical Applications: Case 1 in Clinic

Questions to ponder as we look at Case 1.

Based on the information AB provided online and the initial anthropometric and vital statistic takes at clinic, make a list of NEW nutrition related issues you observe from the data provided.

37

Self Assessment: NFPE on AB

I. Overall Appearance & Body Language	II. Vital Signs, Cardio-pulmonary
Anxious, thin M, states feeling better. Very busy with schoolwork and doesn't have 'time to waste.' He must make top grades to stay in school. Not much appetite. Lost some weight since fall.	No history of hypertension. Feels tired most of the time. He does not exercise routinely. C/O insomnia. Sleeps 3-4 hr/night. Drinks energy drinks 2-3x day
III. Hydration	**IV. Skin & Nails**
Mucous membranes are pale and dry. Lips are dry but not cracked. Tongue sensitive to touch by tongue depressor.	Skin is pale with multiple bruises from fall. Skin under eyes appears dark. Nails are chewed and flat. Some have ridged texture. Injuries from fall haven't healed.
V. Oral Cavity	**VI. Digestive System**
No problems chewing or swallowing. Gums are red and puffy. Tongue is dark red & smooth in center.	Occasional GI distress- he thinks is related to stress. Takes OTC antacids.
VII. Extremities- Bones and Muscles	**VIII. HEENT & Cognition**
Tech-neck and rounded shoulders. C/O fingers and toes tingling and cold. Appears to have mild muscle loss in upper torso, arms. Reduced grip strength for age and gender.	C/O dry eye and eye fatigue after spending 4+ hours on computer without a break. Screentime 16-18 hr/d. Reports 'eyesight isn't good at night. Too many bright lights.'

38

Practical Applications: Case 1 in Clinic

Does AB have moderate or severe malnutrition?

Use both AND/ASPEN & GLIM criteria

39

Academy/ASPEN Characteristics of Moderate Malnutrition for AB

Characteristic	Acute Illness/Injury	Chronic Illness	Social/Environmental
1. Insufficient Energy Intake	< 75% for > 7 days	< 75% for > or = to 1 mo	< 75% for > or = to 3 mos
2. Interpretation of Weight Loss	1-2%/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
3. Changes in Body Composition: Loss of Body Fat	Mild depletion	Mild depletion	Mild depletion
4. Changes in Body Composition: Loss of Muscle Mass	Mild depletion	Mild depletion	Mild depletion
5. Changes in Body Composition: Accumulation of Fluid	Mild	Mild	Mild
6. Grip Strength	Not Applicable (for severe malnutrition reduced grip strength)	Not Applicable (for severe malnutrition reduced grip strength)	Not Applicable (for severe malnutrition reduced grip strength)

Adapted from and used with permission White, J. 2012.

40

GLIM Criterion for Diagnosis of Adult Malnutrition

Phenotypic Criteria	Interpretation	Etiologic Criteria	Interpretation
Weight loss (%)	> 5% within past 6 mos	**Reduced Food Intake or Assimilation**	≤ 50% estimated energy requirement for > 1 wk **Or** Any reduction for > 2 wks **Or** any chronic GI condition that adversely impacts food assimilation
Low BMI	< 20 if < 70 yrs < 22 if > 70 yrs **Asia:** <18.5 if < 70 yrs < 20 if > 70 yrs	**Inflammation**	Acute disease/injury related **Or** Chronic disease related
Reduced Muscle Mass	Measured by validated body composition measuring techniques		

Adapted from Cederholm, 2019. Open access

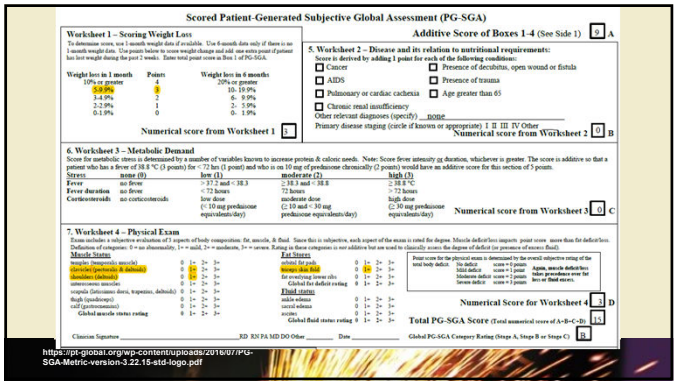
41

GLIM Phenotypic Criterion For Severity of Adult Malnutrition

Phenotypic Criteria	Moderate	Severe
Weight loss (%)	> 5% within past 6 mos **Or** 10-20% beyond 6 mos	> 10% within past 6 mos **Or** > 20% beyond 6 mos
Low BMI	< 20 if < 70 yrs **Or** < 22 if > 70 yrs **Asia:** <18.5 if < 70 yrs **Or** < 20 if > 70 yrs	<18.5 if < 70 yrs **Or** < 20 if > 70 yrs
Reduced Muscle Mass	Mild to moderate loss as measured by validated methods	Severe loss as measured by validated methods

Adapted from Cederholm, 2019. Open access

42



43

Nutrition Assessment

Component in Blood	Standard Range	Labs from UC 8/17 (NF)	Labs from Clinic 9/16 (F)
SODIUM	135-146 mEq/L; 135 - 146 mmol/L	146 mmol/L	136 mmol/L
POTASSIUM	3.5 - 5.0 mEq/L; 3.5 - 5.0 mmol/L	3.7 mmol/L	3.6 mmol/L
CHLORIDE	98 – 106 mEq/L; 98 - 106 mmol/L	109 mmol/L	99 mmol/L
BUN	10.0 - 20.0 mg/L; 3.6-7.1 mmol/L	10.7 mmol/L	6.6 mmol/L
GLUCOSE	70 - 99 mg/L; 3.9-6.0 mmol/L	8.9 mmol/L	6.8 mmol/L
CREATININE M	0.6 - 1.2 mg/L;53-106 μmol/L	53 μmol/L	58 μmol/L
ALBUMIN	3.5 - 5.0 g/dL; 35-50 g/L	39 g/L	29 g/L
HEMOGLOBIN M	14-18 g/dL; 8.7-11.2 mmol/L	6.5 mmol/L	5.5 mmol/L
HEMATOCRIT M	42%-52%; 0.42-0.52	0.33	0.30
MCV	81.0 - 95.0 μm^3 ; 81.0 - 95.0 fL	99 fL	103 fL
Vitamin B12	160-950 pg/mL;118-701 pmol/L	NA	620 pmol/L
Folate	3-20 ng/mL; 7-45.3 nmol/L	NA	15 nmol/L
TSH	3-12 μU/mL; 3-12 mU/L	NA	1.8 μU/mL

44

Poll 3: Case 1 in UC

What is your assessment of AB's current lab test results in context of nutrition and health status?

A. Normal lab test results, no concerns
B. Microcytic anemia, type 2 diabetes, celiac disease
C. Macrocytic anemia, hypothyroidism, hyperglycemia
D. Vitamin A deficiency, Vitamin D deficiency, protein malnutrition

45

Lab Assessment of Nutrition Status

Component in Blood	Standard Range	Labs from ED 8/17 (NF)	Labs from Clinic 9/16 (F)
SODIUM	135-146 mEq/L; 135 - 146 mmol/L	146 mmol/L ↑	136 mmol/L
POTASSIUM	3.5 - 5.0 mEq/L; 3.5 - 5.0 mmol/L	3.7 mmol/L	3.6 mmol/L
CHLORIDE	98 – 106 mEq/L; 98 - 106 mmol/L	109 mmol/L ↑	99 mmol/L
BUN	10.0 - 20.0 mg/L; 3.6-7.1 mmol/L	10.7 mmol/L ↑	6.6 mmol/L
GLUCOSE	70 - 99 mg/L; 3.9-6.0 mmol/L	8.9 mmol/L ↑	7.3 mmol/L↑ (131 mg/dL) need A1C
CREATININE M	0.6 - 1.2 mg/L;53-106 μmol/L	53 μmol/L	58 μmol/L
ALBUMIN	3.5 - 5.0 g/dL; 35-50 g/L	39 g/L	29 g/L ↓
HEMOGLOBIN M	14-18 g/dL; 8.7-11.2 mmol/L	6.5 mmol/L↓	5.5 mmol/L ↓
HEMATOCRIT M	42%-52%; 0.42-0.52	0.33 ↓	0.30 ↓
MCV	81.0 - 95.0 μm^3 ; 81.0 - 95.0 fL	99 fL	103 fL ↑
Vitamin B12	160-950 pg/mL;118-701 pmol/L	NA	220 pmol/L ↓ need MMA
Folate	3-20 ng/mL; 7-45.3 nmol/L	NA	8 nmol/L
TSH	3-12 μU/mL; 3-12 mU/L	NA	1.8 μU/mL ↓ more tests needed

46

Nutrition Assessment: Nutrient Deficiencies Suspected or Identified

Moderate malnutrition – wt loss, diet, low BMI, smooth tongue
Micronutrient deficiencies:

- Iron deficiency r/t labs, appearance of nails, chronic fatigue, & diet
- Vitamin B12 r/t labs, Rx and OTC PPI, chronic fatigue, dark red tongue, sensitive to touch, diet
- Vitamin A r/t client report of dry eyes and difficulty seeing at night, poor wound healing, diet
- Vitamin C r/t appearance of gums, poor wound healing, diet
- Zinc r/t Rx and OTC PPI, poor wound healing, diet

47

Is Poor Diet an Equal Opportunity Killer?

"Poor diet quality is a leading and preventable cause of adverse health globally"

Dr Victoria Miller

GBD 2017 Diet Collaborators. *The Lancet*, 3 April 2019
Miller,V et al. Lancet Planet Health 2020; 4: e352–70.
DOI:https://doi.org/10.1016/S2542-5196(20)30162-5

48

49

Thank you!

Credit Hours: Please watch for a follow up email with detailed information on how to obtain your certificate (instructions are also on the next slide).

Watch our emails for upcoming programs.

Sign up for free membership at www.beckydorner.com for free resources, discounts on CPE courses, webinars, publications, and valuable practice tips and tools.

50

Certificates (Free Webinars)

1. Log into your account using the same email address you used when registering for the webinar. Not a Member? Create your free account at https://www.beckydorner.com/become-a-member/. You must be a member to obtain your certificate.
2. Access the recording, download handouts, and review instructions on how to receive your CPE certificate at: https://www.beckydorner.com/free-resources/free-cpes/
3. Choose the appropriate webinar to access all the information.
4. Follow the instructions to obtain your certificate.

51

References from *Sharpen Your Edge: Integrating NFPE & Lab Assessment* with Dr. Mary Litchford, PhD, RDN, LDN
Thursday April 13, 2023

1. Bahat, G. et al. Comparing SARC-F with SARC-CalF to Screen Sarcopenia in Community Living Older Adults. J Nutr Health Aging 2018. 22, 1034–1038. https://doi.org/10.1007/s12603-018-1072-y
2. Bauer, J, Kaiser, M Mini Nutritional Assessment- its history, today's practice & future perspectives. Nutr Clin Prac. 2008. 23:388-396
3. Becker, P, et al. Consensus statement of the Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition: Indicators recommended for the identification and documentation of pediatric malnutrition (undernutrition). J. Acad. Nutr. Diet. 2015, 114, 1988–2000.
4. Belafsky, P et al. Validity and reliability of the eating assessment tool (EAT-10). Annals of Otology, Rhinology & Laryngology. 2008; 117(12): 919-924
5. Bickley,L. Bates guide to physical examination, 13th ed. Philadelphia, PA: Lippincott, 2020.
6. Bohannon, R. Considerations and Practical Options for Measuring Muscle Strength: A Narrative Review, BioMed Research International, 2019, https://doi.org/10.1155/2019/8194537
7. Bohannon, R. Grip strength impairments among older adults receiving physical therapy in a home care setting. Perceptual and Motor Skills:2010. 111(3) 761-764.
8. Callus, C.et a. Scurvy is Back. *Nutrition and metabolic insights, 2018.* 11, 1178638818809097. https://doi.org/10.1177/1178638818809097
9. Carney, E. Correlation of Dark Adaptation Test Results with Serum Vitamin A Levels in Diseased Adults. *J Nutr.* 110: 552-557, 1980.
10. CDC: 4 Stage Balance Test. 2017 https://www.cdc.gov/steadi/pdf/4-Stage_Balance_Test-print.pdf
11. Cederholm T, et al, GLIM Core Leadership Committee; GLIM Working Group. GLIM criteria for the diagnosis of malnutrition - A consensus report from the global clinical nutrition community. Clin Nutr. 2019 Feb;38(1):1-9. doi: 10.1016/j.clnu.2018.08.002. Epub 2018 Sep 3. PMID: 30181091
12. Ferguson M et al. Development of a valid and reliable malnutrition screening tool for adult acute hospital patients. Nutrition 1999;15, (6): 458-464
13. Goldberg DL, Becker PJ, Brigham K, et al. Identifying Malnutrition in Preterm and Neonatal Populations: Recommended Indicators. J Acad Nutr Diet. 2018 Sep;118(9):1571-1582
14. Guralnik JM, Simonsick EM, Ferrucci L, et al. A short physical performance battery assessing lower extremity function: association with self-reported disability and prediction of mortality and nursing home admission. J Gerontol 1994;49:M85-M94

15. Kong, A, Acanthosis Nigricans: High Prevalence and Association with Diabetes in a Practice-based Research Network Consortium A PRImary care Multi-Ethnic Network Study. *J Am Board Fam Med*. 2010;23(4):476-485.
16. Litchford, M. Laboratory Assessment of Nutritional Status. 2017. Greensboro NC: CASE Software & Books. www.casesoftware.com
17. Maguolo, A, Maffeis,C .Acanthosis nigricans in childhood: A cutaneous marker that should not be underestimated, especially in obese children. *Acta Paediatrica.* 2019. https://onlinelibrary.wiley.com/doi/abs/10.1111/apa.15031
18. Parrott, J et al. American Society for Metabolic and Bariatric Surgery Integrated Health Nutritional Guidelines for the Surgical Weight Loss Patient 2016 Update: Micronutrients. SOARD 2017. https://asmbs.org/app/uploads/2017/06/ASMBS-Nutritional-Guidelines-2016-Update.pdf
19. Prado,C et al., Implications of low muscle mass across the continuum of care: a narrative review. Annals of Medicine, 2018. 50:8, 675-693, DOI: 10.1080/07853890.2018.1511918
20. Secker DJ, Jeejeebhoy KN. Subjective global nutritional assessment for children. Am J Clin Nutr. 2007;85(4):1083-1089.
21. White JV, et al. 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). J Parenter Enteral Nutr 2012;36:275–283.
22. White M, Lawson K, Ramsey R, et al. Simple nutrition screening tool for pediatric inpatients. J Parenter Enter Nutr. 2015; 40(3): 392- 398.