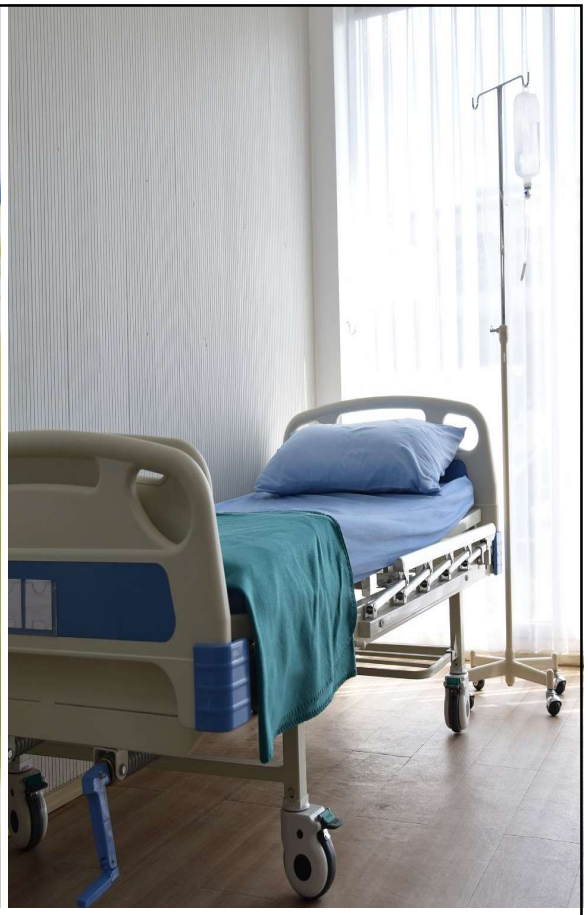

THE METABOLIC CONUNDRUM: MALNUTRITION IDENTIFICATION, DIAGNOSIS, AND INTERVENTION

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ABOUT ME – NO DISCLOSURES

- David Kellenberger, DMS, MPAS, RDN, PA-C
  - University Florida College of Agriculture and Life Science (1999)
  - Massachusetts General Hospital Dietetic Internship (2000)
  - University of Florida College of Medicine (2005)
  - Debusk College of Osteopathic Medicine Doctor of Medical Science (2018)

OBJECTIVES

- Define Malnutrition and its Impact
- Discuss Nutrition Care Workflow
- Review Screening Methods
- Diagnosis
- Discuss Optimal Team-based care
- Review Interventions that Matter

aspen® American Society for Parenteral and Enteral Nutrition

eat right. Academy of Nutrition and Dietetics

ESPEN
The European Society for Clinical Nutrition and Metabolism

FEDERACIÓN LATINO AMERICANA DE TERAPIA NUTRICIONAL, NUTRICION CLINICA Y METABOLISMO
FELANPE

PENSA
Parenteral and Enteral Nutrition Society of Asia
1995

Global Leadership Initiative on Malnutrition (GLIM)

4

A Definition of Malnutrition

- An acute, subacute or chronic state of nutrition in which a combination of varying degrees of over- or undernutrition and inflammatory activity has led to a change in body composition and diminished function''. Important in this definition is taking into account the degree of inflammation.
- It can be over and under-nutrition
- It can occur acutely or chronically.
  - Acutely, malnutrition is due to increased nutrient demand related to bowel surgery and NPO status without adequate nutrition.
  - Chronic Social malnutrition is food insecurity and lack of regular meals or homelessness
  - Chronic Disease malnutrition can be due to diseases such as CHF or COPD

Soeters PB, Schols AM. Advances in understanding and assessing malnutrition. *Curr Opin Clin Nutr Metab Care*. 2009;12(5):487-494. doi:10.1097/MCO.0b013e32832da243

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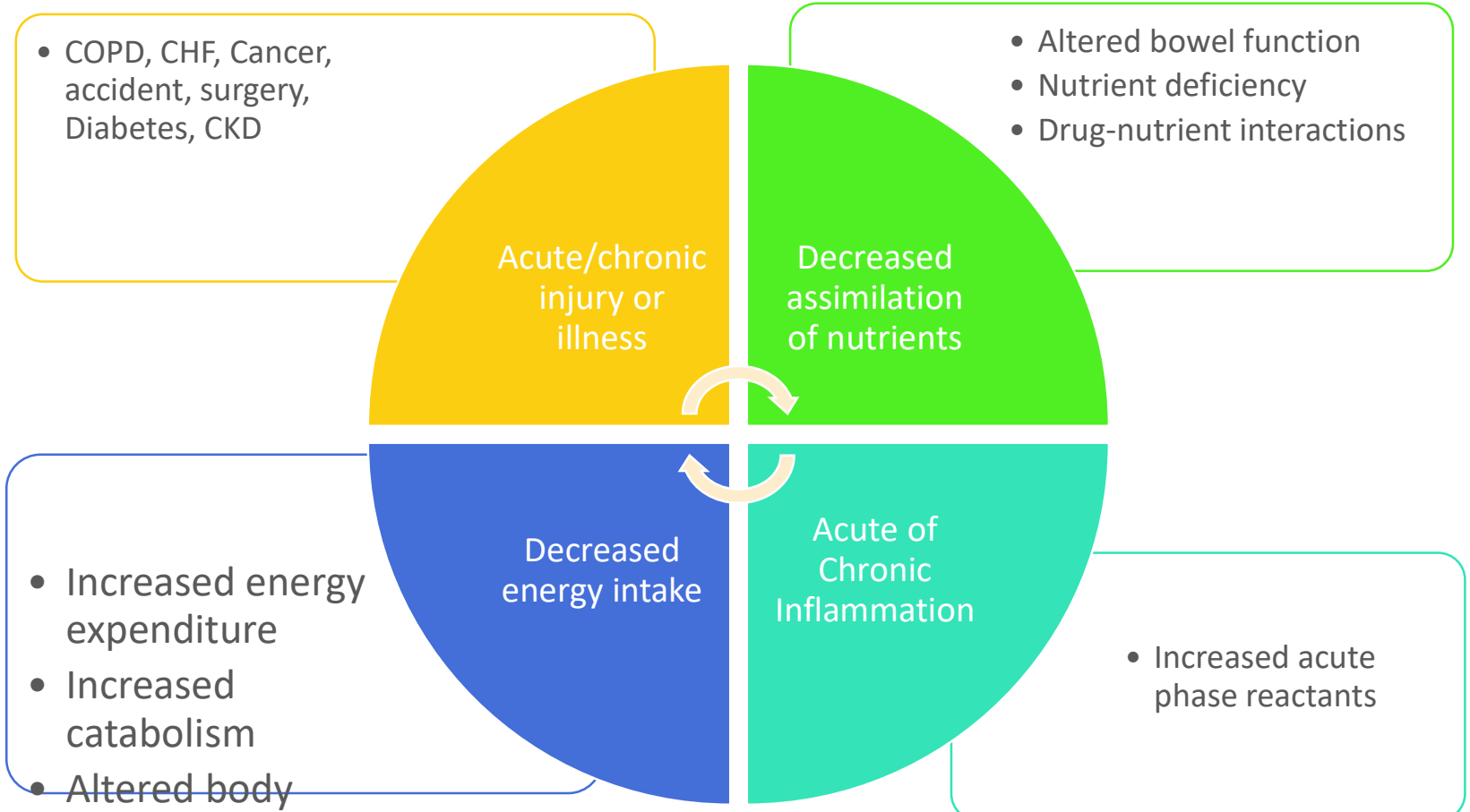


Cederholm T, Jensen GL, Correia MITD, et al. GLIM criteria for the diagnosis of malnutrition – A consensus report from the global clinical nutrition community. *Clinical Nutrition*. 2019;38(1):1-9. doi:10.1016/j.clnu.2018.08.002

MALNUTRITION IS A HIGHLY PREVENTABLE CONDITION

- **50%**
  - Malnutrition affects 20–50% of patients at risk of becoming or being malnourished.
- **8%**
  - Malnutrition is typically only diagnosed in 8% of hospitalized patients, leaving many potentially undiagnosed and untreated.
- **31%**
  - Up to 31% of malnourished patients and 38% of well-nourished patients experience nutritional decline during their hospital stays.

Malnutrition Matters. MQii. Accessed February 26, 2024. https://malnutritionquality.org/malnutrition-matters/

MALNUTRITION POSES A SIGNIFICANT BURDEN TO PATIENTS AND HOSPITALS

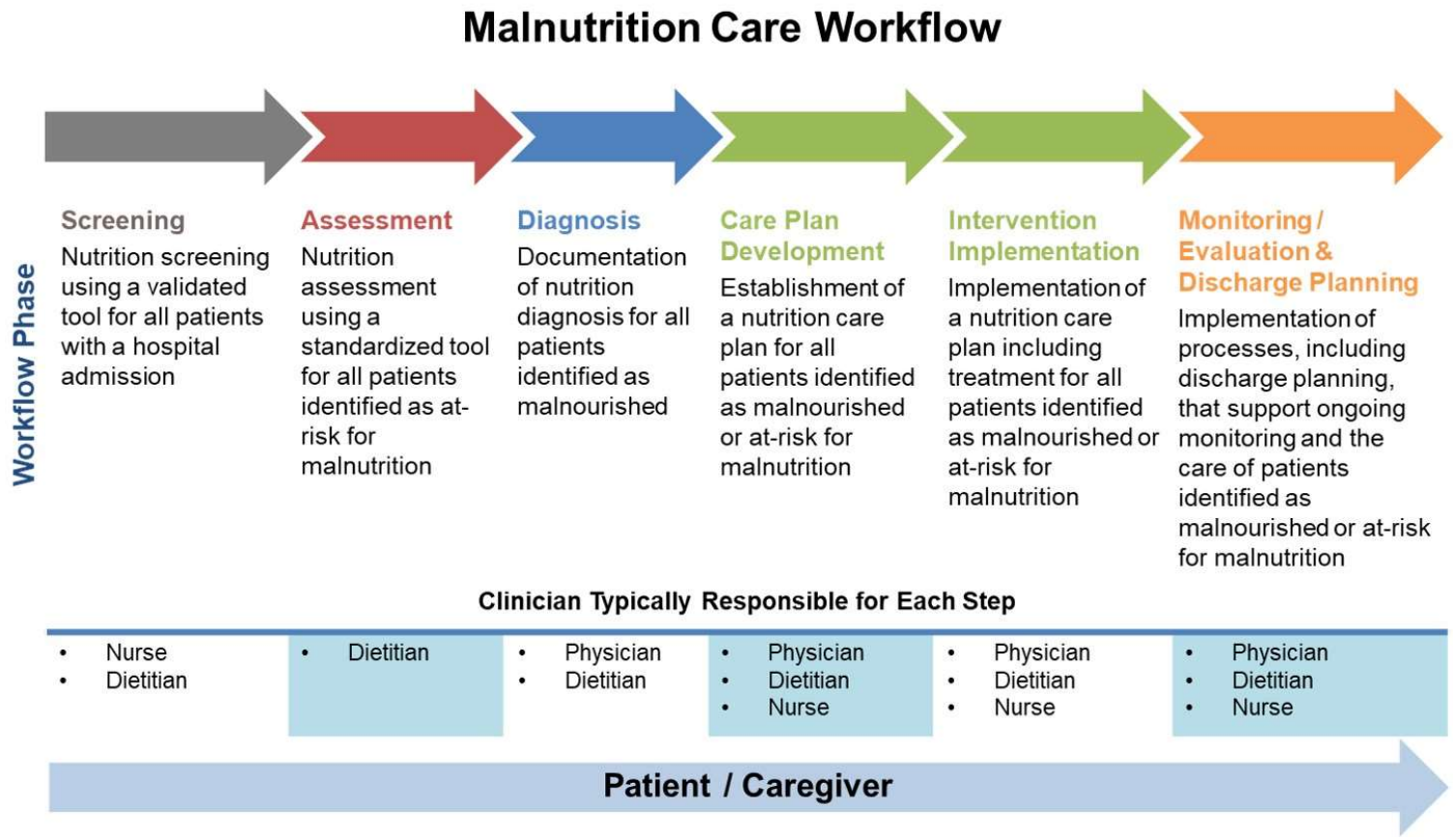
- **5x**
  - the maximum likelihood of in-hospital death compared to the general patient population.
- **56%**
  - higher likelihood of 30-day readmissions, with septicemia as the leading diagnosis upon readmission.
- **34%**
  - higher costs for a malnourished patient hospital stay compared to non-malnourished patients.

Malnutrition Matters. MQii. Accessed February 26, 2024. https://malnutritionquality.org/malnutrition-matters/

ADDRESSING MALNUTRITION CAN IMPROVE PATIENT OUTCOMES AND LOWER COSTS

- **27%**
  - reduction of 30-day readmission rates for a multi-hospital ACO that optimized its malnutrition care.
- **$4.8M**
  - in cost savings generated by a 4-hospital system implementing a nutrition-focused quality improvement program.
- **24%**
  - relative reduction in readmission risk for malnourished patients with a nutrition care plan vs. those without a care plan.

Malnutrition Matters. MQii. Accessed February 26, 2024. https://malnutritionquality.org/malnutrition-matters/



Malnutrition Care Process. (n.d.). *MQii*. Retrieved February 24, 2024, from https://malnutritionquality.org/malnutrition-care-process/

OUR CASE FOR DISCUSSION

Ingrid Carolina Magdelena Haselbacher Federspiel Schmuck

A BRIEF BACKGROUND

- Chief Complaint of swallowing difficulty with weight loss
- MHx of HTN, Dementia, HLD, Hx of breast CA, MDD, OSA, and hyperthyroidism s/p radioactive iodine.
- Surgical Hx: Open cholecystectomy, complete mastectomy left breast, uterine prolapse with lift
- Family Hx: Hemochromatosis, dementia, breast cancer, father with fatal gunshot wound WW2
- Social Hx, remote hx of social tobacco use and social drinking; stopped in her 30's
- ROS: Positive for memory loss, choking on foods, weight loss, increased fatigue, and daytime sleeping.

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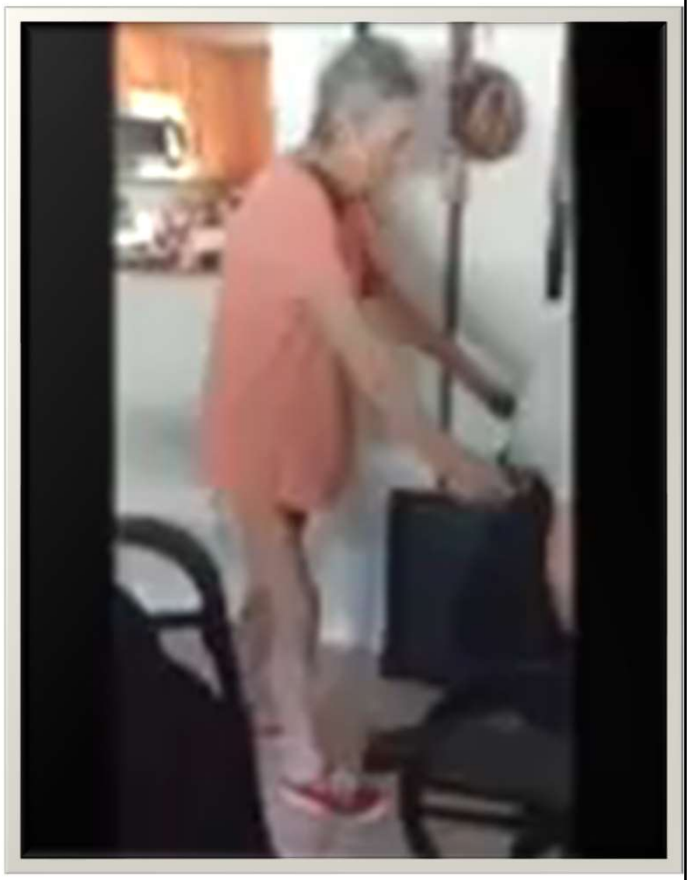
A BRIEF BACKGROUND

- PE: All exam findings were unremarkable except lethargy, muscle and body fat loss, and depressed mood.
- 09/2021: Starting UBW: 148#, Ht: 64 inches, BMI: 25.4 kg/m2
- 12/2021: Wt: 125#, BMI 21.5, % wt. lost 15.5% in 3 months
- 3/2022: Wt: 118#, BMI 20.3, % wt. lost 20.2% in 6 months
- 6/2022: Wt: 110#, BMI 18.9, % wt. lost 25.6% in 9 months



A BRIEF BACKGROUND

- Barium swallow performed in 9/2022 showed a delay in the passage of barium, **cannot exclude obstructing lesion**
- Dietitian consult
- Diet consistency modified, started on oral nutrition supplements
- Progressive weight loss with **progressive dysphagia** and **no change in intervention** from the medical team
- Interdisciplinary meeting with extended family in March 2023; physician's DDx discussed and nutrition care plan.
- Family site visit with the care team in Florida to "have a very important discussion"

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A BRIEF BACKGROUND

- Progressive decline for 9 months and no GI eval, no change to plan despite discussions with PCP, nursing, and clinical nutrition
- MRI ordered; GI consult made
- Multiple attempts at altered consistency diet and nutrition supplements, multiple attempts at SLP consult
- Demands for intervention are unaddressed by the team, and there is a 3+ month wait for GI evaluation.
- Circumvented PCP with ED visit, request for PEG, EGD incomplete due to esophageal mass. A surgical G-tube was placed.
- **Remember the barium swallow!**

SCREENING METHODS

- Many different tools exist
- Long and short forms (practice vs. research)
- Inpatient, outpatient, geriatric, or pediatric?
- Subjective Global Nutrition Assessment Gold Standard, but long
- Screening tools such as the Malnutrition Screening Tool are as short as two questions

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SCREENING METHODS

Pick one appropriate for your practice

- Malnutrition Screening Tool (MST)
- Mini Nutritional Assessment – Short Form (MNA-SF)
- Malnutrition Universal Screening Tool (MUST)
- SNAQ

EAL. Accessed February 24, 2024.
https://www.andeal.org/topic.cfm?cat=3853&conclusion_statement_id=251103&highlight=malnutrition&home=1

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SCREENING TOOLS

TOOL	Sensitivity	Specificity	Positive Predictive Value	Negative Predictive Value	OVERALL VALIDITY[b]	Generalizability	Evidence Grade Rank
MST[e]	Moderate	Moderate	Moderate	Moderate	**MODERATE**	**Good**	**I, *Good/strong***
MUST[f]	Moderate	Moderate	Moderate	High	**HIGH**	**Fair**	**II, *Fair***
MNA-SF[g]	Moderate	Moderate	Low	Moderate	**MODERATE**	**Fair**	**II, *Fair***
SNAQ[h]	Moderate	High	Low	High	**MODERATE**	**Fair**	**II, *Fair***

Adapted from: Skipper A, Coltman A, Tomesko J, et al. Position of the Academy of Nutrition and Dietetics: Malnutrition (Undernutrition) Screening Tools for All Adults. *Journal of the Academy of Nutrition and Dietetics*. 2020;120(4):709-713. doi:10.1016/j.jand.2019.09.011

Diagnosis of Malnutrition

- Acute, chronic, social/environmental
- **Two** of the following characteristics must be present
  - Weight loss
  - Insufficient Energy
  - Loss of Muscle
  - Loss of Fat
  - Generalized or Localized Edema
  - Diminished Functional Status

Malnutrition is diagnosed by history and physical exam

Mogensen KM, Malone A, Becker P, et al. Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition Consensus Malnutrition Characteristics: Usability and Association With Outcomes. *Nutr Clin Pract*. 2019;34(5):657-665. doi:10.1002/ncp.10310

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ASPEN MODERATE SEVERITY GRADING

Characteristic	Acute Injury or Illness	Chronic Disease
Wt.	1-2% in 1 week, 5% in one month, and 7.5% in 3 monhs	5% in one month, 7.5% in 3 months, 10% in 6 months and 20% in 1 year
Energy	< 75% in 7 days	<75% in one month
Body Fat	Mild depletion	Mild depletion
Muscle Mass	Mild depletion	Mild depletion
Fluid	Mild	Mild
Grip	N/A	N/A

Malone A, Hamilton C. The Academy of Nutrition and Dietetics/The American Society for Parenteral and Enteral Nutrition Consensus Malnutrition Characteristics. *Nutrition in Clinical Practice*. 2013;28(6):639-650. doi:10.1177/0884533613508435

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ASPEN SEVERE SEVERITY GRADING

Characteristic	Acute Injury or Illness	Chronic Disease
Wt.	>2% in 1 week, >5% in one month, and >7.5% in 3 months	>5% in one month, >7.5% in 3 months, >10% in 6 months and >20% in 1 year
Energy	< 50% in 5 days	<75% in one month
Body Fat	Moderate depletion	Moderate depletion
Muscle Mass	Moderate depletion	Moderate depletion
Fluid	Moderate-severe	Mild
Grip	N/A	N/A

Malone A, Hamilton C. The Academy of Nutrition and Dietetics/The American Society for Parenteral and Enteral Nutrition Consensus Malnutrition Characteristics. *Nutrition in Clinical Practice*. 2013;28(6):639-650. doi:10.1177/0884533613508435

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What are your thoughts about Ingrid?

Severe PCM r/t dysphagia due to esophageal cancer AEB >7.5% wt. loss in 3 months, significant muscle wasting and functional decline

- Screening
- Assessment
  - >7.5% in 3 months
  - Mod-severe Muscle and Fat Wasting
  - Functional decline
- Diagnosis
  - What are your thoughts?
  - Miss or delayed diagnosis?

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the Identification, Evaluation and Diagnosis of

- Perform Nutrition Screening and assess risk
- Perform Nutrition Assessment
- Apply GLIM Diagnostic Indicators
- Apply GLIM Severity Grading

MALNUTRITION

The future of diagnosis

Cederholm T, Jensen GL, Correia MITD, et al. GLIM criteria for the diagnosis of malnutrition – A consensus report from the global clinical nutrition community. *Clinical Nutrition*. 2019;38(1):1-9. doi:10.1016/j.clnu.2018.08.002

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Evaluation and

- **Phenotypic Criteria**
  - Unintentional Wt. loss over time >5% in 6 mths, >10% beyond 6 months
  - Low BMI <20 if <70 and <22 if >70
  - Reduced muscle mass based on PE, BIA, CT, US, MUA or calf circumference
- **Etiologic Criteria**
  - Reduced food intake or assimilation >50% for 1-2 weeks or any reduction if >2 weeks
  - Any disease that causes problems with assimilation
  - Inflammation and disease burden: acute or chronic
  - Role for supportive lab data: CRP, albumin or pre-albumin

YE S

YES

If at least one criterion from each section is answered as yes, than malnutrition is present

Cederholm T, Jensen GL, Correia MITD, et al. GLIM criteria for the diagnosis of malnutrition – A consensus report from the global clinical nutrition community. *Clinical Nutrition*. 2019;38(1):1-9. doi:10.1016/j.clnu.2018.08.002

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Identification, Evaluation and

- Severity is grade 1, moderate or grade 2, severe
- The severity is based on having at least 1 phenotype criterion
- Moderate: 5-10% in 6 months or >10%-20% in >6 months, BMI <20 (>70), <22 (<70), mild to moderate muscle loss
- Severe: >10% in 6 months or >20% in >6 months, BMI <18.5 (>70), <20 (<70), severe muscle loss

Cederholm T, Jensen GL, Correia MITD, et al. GLIM criteria for the diagnosis of malnutrition – A consensus report from the global clinical nutrition community. *Clinical Nutrition*. 2019;38(1):1-9. doi:10.1016/j.clnu.2018.08.002

What are your thoughts about Ingrid?

Severe: > 10% in 6 months or >20% in >6 months, BMI <18.5 (>70), <20 (<70), severe muscle loss

Grade 2 Severe PCM r/t dysphagia due to esophageal cancer AEB >10 % wt. loss in 6 months, 25% in 9 months, and significant muscle wasting based on physical exam, BMI 18.9

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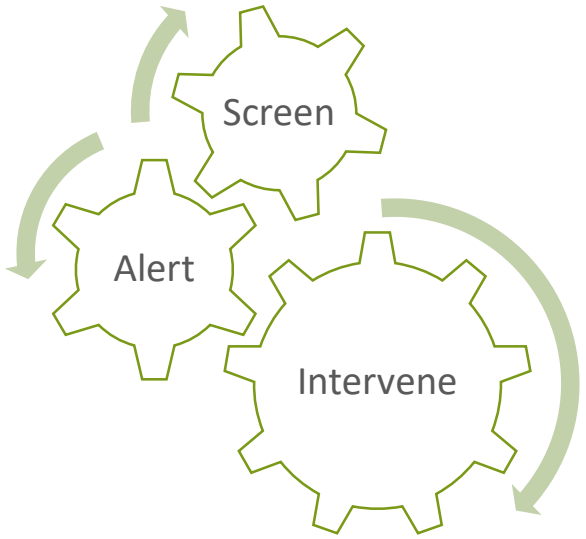
OPTIMAL TEAM-BASED CARE

- Screening with quick and easy tools such as the Malnutrition Screening Tool (MST)
- Alert your clinical team. An automatic consult was generated for RD, but what about your medicine or surgery team?
- Nursing, clinical nutrition, and medicine come together to identify and make the right diagnosis, communicate, intervene, and follow up.



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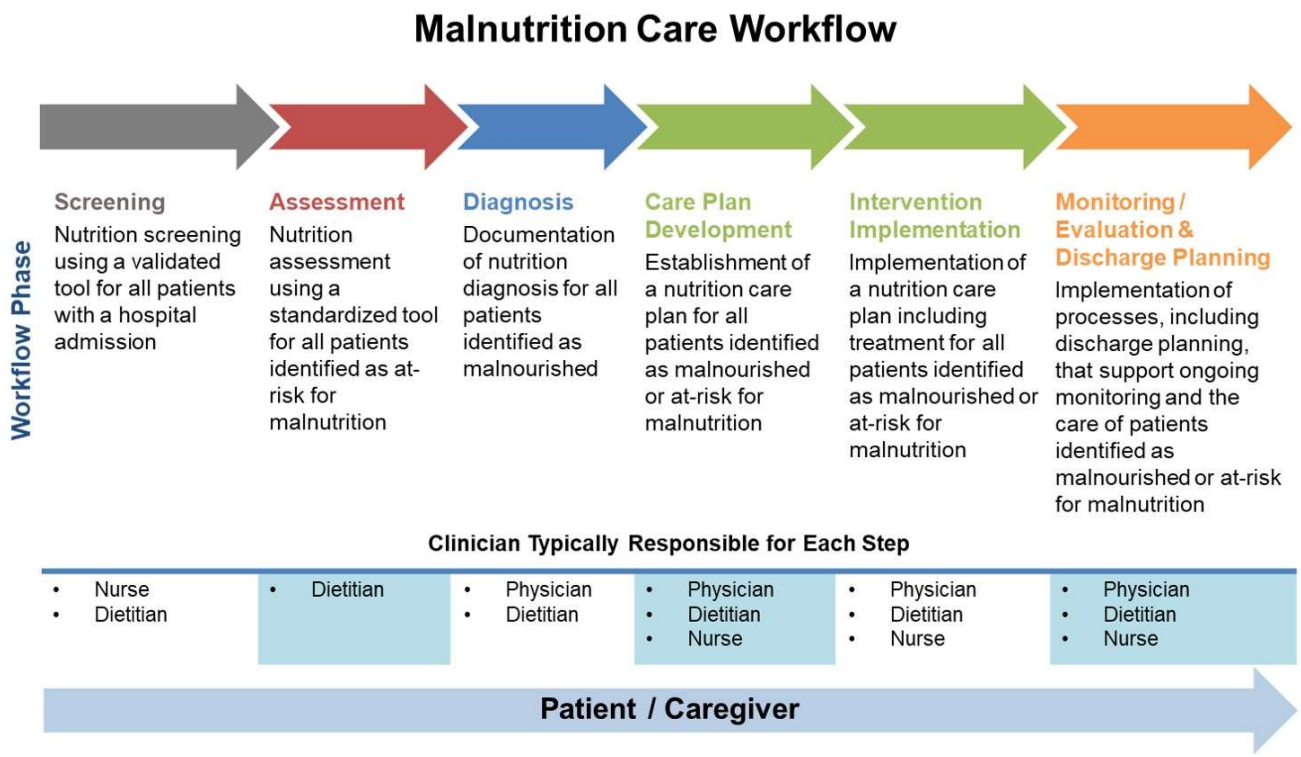
What went wrong?



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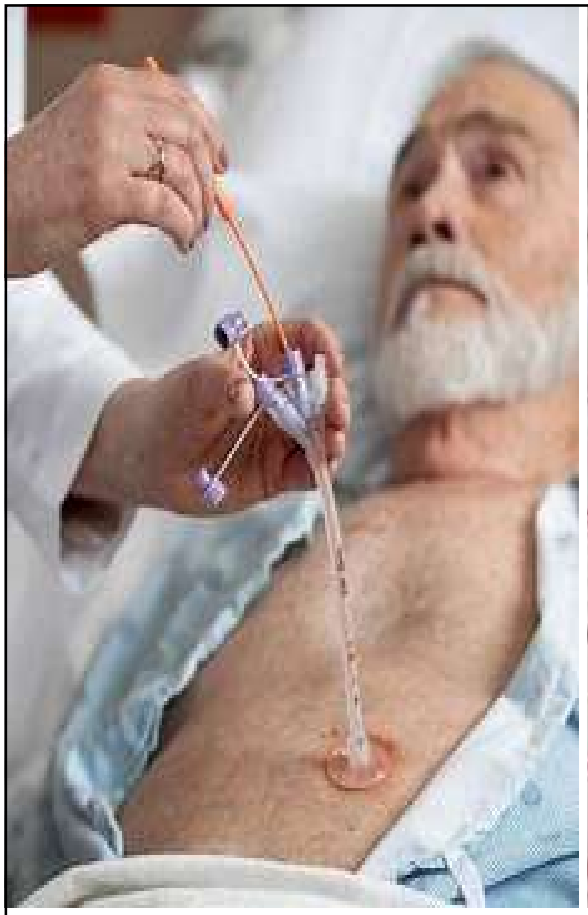

INTERVENTIONS THAT MATTER

INTERVENTIONS THAT MATTER- MINIMUM REQUIRED

- Routine screening for malnutrition with a validated tool
- Followed by assessment, individualized intervention, monitoring and adjustment of interventions
- Individualized and comprehensive nutritional care
- Nutritional interventions as part of a multimodal and multidisciplinary team intervention
- Identification and elimination of potential causes of malnutrition
- Avoidance of dietary restrictions

INTERVENTIONS THAT MATTER- SUPPORTIVE

- Pleasant eating environment in institutions
- Mealtime assistance in case of eating dependency
- Sharing mealtimes with others
- Energy-dense meals on wheels with additional meals
- Nutritional information and education
- Easy access to food

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INTERVENTIONS THAT MATTER- MODIFIED FOODS

- Food fortification
- Additional snacks/meals, finger food
- Texture-modified, enriched foods
- Organoleptic enhancement (flavor/taste/visual appearance)
- Increasing variety of diet
- Considering individual preferences

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INTERVENTIONS THAT MATTER- ADVANCED

- Nutrition support
  - Enteral or parenteral
- Oral Nutritional supplements (ONS) such as Boost or Ensure
- Modular nutritional supplements
  - Protein
- Vitamins and minerals

INTERVENTIONS THAT MATTER- ADVANCED

- Medications to augment appetite
  - Mirtazapine
  - Megestrol
- Underlying disease management
- Medication side-effects

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What happened to Ingrid?

Weight regained with surgical PEG and TF, XRT with remission of tumor and normal eating resumed, weight currently 138# and still in remission.

The care plan, intervention, and monitoring only work if the diagnosis is correct

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Ingrid Kellenberger

MOM!

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QUESTION 1

Malnutrition is predominantly a chronic disease associated with decreased energy intake, social determinants of health, and food insecurity.

True or False

QUESTION 2

According to the American Society of Parenteral and Enteral Nutrition and the Academy of Nutrition and Dietetics, Malnutrition has the following characteristics?

A. Decreased energy intake and weight loss

B. Loss of subcutaneous fat and muscle loss

C. Loss of functional status and edema

D. A and B

E. All the above

QUESTION 3

The diagnosis of malnutrition is made by

A. History and Physical

B. Acute phase reactants

C. Ferritin level

D. A and B

E. All the above

QUESTION 4

Malnutrition is a disease diagnosed by a Physician Associate or Registered Dietitian.

True or False

QUESTION 5

Validated nutrition screening tools include:

A. Malnutrition Screening Tool (MST)

B. Mini Nutritional Assessment - Short Form (MNA-SF)

C. Malnutrition Universal Screening Tool (MUST)

D. McDonald's Global Dominance Assessment (MGDA)

E. A, B and C

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QUESTION 6

Malnutrition is a complex disease best treated with a team of practitioners

True or False

QUESTION 7

The most important way to treat malnutrition is to know it exits and screen for it.

True or False

47

QUESTION 8

The Global Leadership Initiative on Malnutrition (GLIM) method uses two groups of criteria to diagnose malnutrition: phenotypic criteria and etiologic.

True or False

48

QUESTION 9

People with malnutrition are _____ times more likely to die an in-hospital death compared to the general population.

A. 3

B. 5

C. 8

D. 10

49