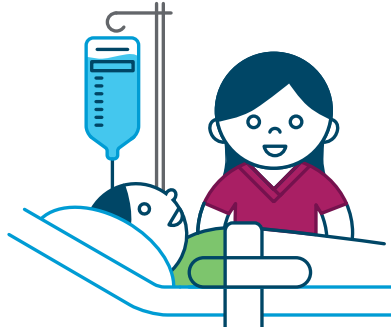# MALNUTRITION AND THE NUTRITION-FOCUSED PHYSICAL EXAM (NFPE)

WHAT IS MALNUTRITION?

Malnutrition is defined as an, "acute, subacute, or chronic state of nutrition, in which a combination of varying degrees of **overnutrition or undernutrition**, with or without inflammatory activity, have led to a change in body composition and diminished function.[1]"

Malnutrition can refer to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients and can occur at any body weight.[2]

IDENTIFYING PATIENTS WITH MALNUTRITION EARLY AND ACCURATELY IS CRITICAL

Malnourished patients have higher healthcare costs, prolonged hospital stays, and increased rates of hospital readmission.[3-4]
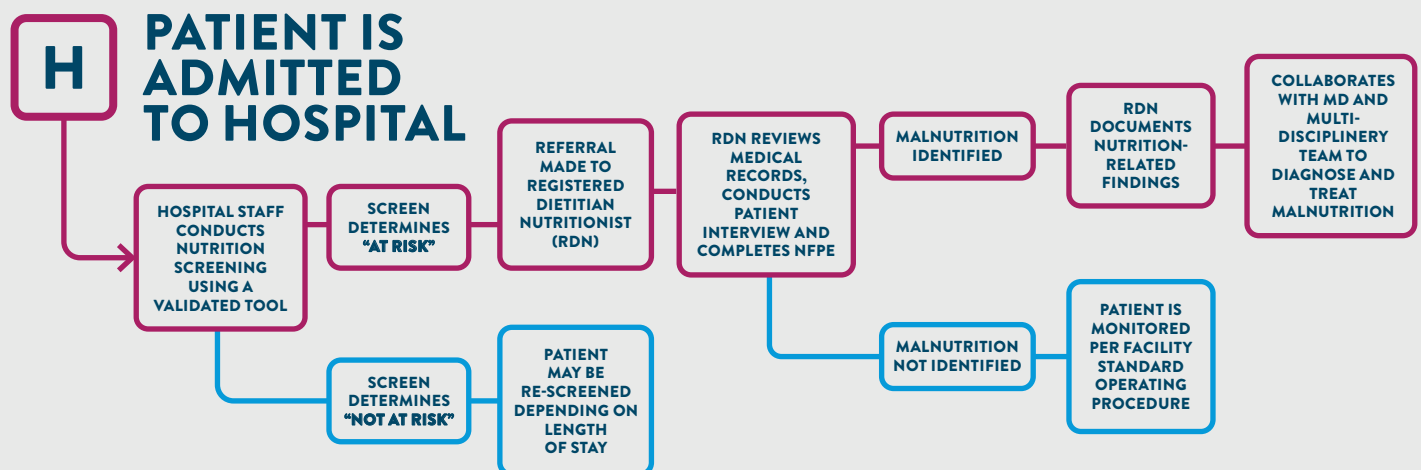
20-50%
OF PATIENTS ARE AT-RISK
FOR MALNUTRITION UPON HOSPITAL ADMISSION[5-7]

ONLY ~7%
OF HOSPITALIZED PATIENTS ARE DIAGNOSED WITH MALNUTRITION,
LEAVING MANY OTHERS UNDIAGNOSED AND UNTREATED[8]

IDENTIFYING MALNUTRITION IN THE HOSPITAL SETTING USING A STANDARDIZED NUTRITION CARE PATHWAY

H PATIENT IS ADMITTED TO HOSPITAL

→ HOSPITAL STAFF CONDUCTS NUTRITION SCREENING USING A VALIDATED TOOL

→ SCREEN DETERMINES "AT RISK"

→ REFERRAL MADE TO REGISTERED DIETITIAN NUTRITIONIST (RDN)

→ RDN REVIEWS MEDICAL RECORDS, CONDUCTS PATIENT INTERVIEW AND COMPLETES NFPE

→ MALNUTRITION IDENTIFIED → RDN DOCUMENTS NUTRITION-RELATED FINDINGS → COLLABORATES WITH MD AND MULTI-DISCIPLINERY TEAM TO DIAGNOSE AND TREAT MALNUTRITION

→ MALNUTRITION NOT IDENTIFIED → PATIENT IS MONITORED PER FACILITY STANDARD OPERATING PROCEDURE

→ SCREEN DETERMINES "NOT AT RISK" → PATIENT MAY BE RE-SCREENED DEPENDING ON LENGTH OF STAY

THE NUTRITION-FOCUSED PHYSICAL EXAM (NFPE)

Utilizing the NFPE can help to identify the presence and degree of malnutrition in patients and can positively impact key quality measures.[9]

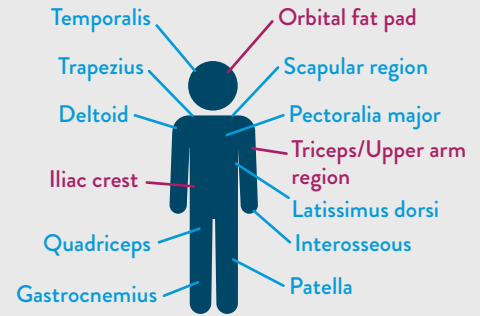## COMPONENTS OF THE NUTRITION ASSESSMENT

- Review the medical chart and conduct a patient interview to collect:
  - Food or nutrition-related history
  - Anthropometric measurements
  - Biochemical data
  - Medical tests and procedures
- NFPE

WHAT IS A NFPE?

A head-to-toe physical examination used by the RDN as part of their nutrition assessment. This hands-on approach allows the RDN to evaluate for:

- Muscle loss
- Fat loss
- Nutrient deficiencies
- Edema
- Functional status

NFPE EVALUATION SITES

- Temporalis
- Trapezius
- Deltoid
- Iliac crest
- Quadriceps
- Gastrocnemius
- Orbital fat pad
- Scapular region
- Pectoralia major
- Triceps/Upper arm region
- Latissimus dorsi
- Interosseous
- Patella

Areas commonly assesed for subcutaneous fat loss (in magenta) and muscle loss (in blue)

MALNUTRITION DIAGNOSIS

The Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition (ASPEN) indicators to diagnose malnutrition (AAIM) tool requires two of the following characteristics for a malnutrition diagnosis[10]:

- Insufficient energy intake
- Unintentional weight loss
- Loss of muscle mass
- Loss of subcutaneous fat
- Localized or generalized fluid accumulation
- Diminished functional status (typically measured by hand grip strength)

Items in blue are identified via NFPE.

SEVERITY AND TYPE OF MALNUTRITION: IDENTIFICATION CHART [11]

	ACUTE ILLNESS / INJURY		CHRONIC ILLNESS		SOCIAL / ENVIRONMENTAL	
	NON-SEVERE (MODERATE MALNUTRITION)	SEVERE MALNUTRITION	NON-SEVERE (MODERATE MALNUTRITION)	SEVERE MALNUTRITION	NON-SEVERE (MODERATE MALNUTRITION)	SEVERE MALNUTRITION
ENERGY INTAKE	<75% OF EER FOR >7 DAYS	≤ 50% OF EER FOR ≥ 5 DAYS	<75% OF EER FOR >1 MONTH	≤ 75% OF EER FOR ≥1 MONTH	<75% OF EER FOR ≥1 MONTHS	≤ 50% OF EER FOR ≥1 MONTH
WEIGHT LOSS	1-2% IN 1 WK. 5% IN 1 MO. 7.5% IN 3 MO.	>2% IN 1 WK. >5% IN 1 MO. >7.5% IN 3 MO.	5% IN 1 MO. 7.5% IN 3 MO 10% IN 6 MO. 20% IN 12 MO.	>5% IN 1 MO. >7.5% IN 3 MO >10% IN 6 MO. >20% IN 12 MO.	5% IN 1 MO. 7.5% IN 3 MO 10% IN 6 MO. 20% IN 12 MO.	>5% IN 1 MO. >7.5% IN 3 MO >10% IN 6 MO. >20% IN 12 MO.
SUBCUTANEOUS FAT	MILD	MODERATE	MILD	SEVERE	MILD	SEVERE
MUSCLE MASS	MILD	MODERATE	MILD	SEVERE	MILD	SEVERE
FLUID ACCUMULATION	MILD	MODERATE TO SEVERE	MILD	SEVERE	MILD	SEVERE
REDUCED GRIP STRENGTH	N/A	MEASURABLY REDUCED	N/A	MEASURABLY REDUCED	N/A	MEASURABLY REDUCED

*EER = ESTIMATED ENERGY REQUIREMENTS

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1. Robinson D, et al. American Society for Parenteral and Enteral Nutrition (ASPEN) definition of terms, style, and conventions used in A.S.P.E.N. board of directors – approved documents. Updated May 2018. | 2. Malnutrition. World Health Organization Website. Accessed May 2024. https://www.who.int/news-room/fact-sheets/detail/malnutrition | 3. Hudson L, et al. JPEN. 2018;42:892-897. | 4. Hiller LD, et al. JPEN. 2017;41:1316-1324. | 5. Allard JP, et al. JPEN. 2016;40:487-497. | 6. Ruiz AJ, et al. Clin Nutr. 2018. | 7. Sauer AC, et al. JPEN. 2019. | 8. Barrett ML BM, et al. August 30, 2018 ed: U.S Agency for Healthcare Research and Quality; 2018. | 9. Phillips W, et al. J Acad Nutr Diet. 2019;119(9)Suppl 2:S68. | 10. White JV, et al. J Acad Nutr Diet. 2012;112:730-738. | 11. Mordarski B, et al. J Acad Nutr Diet. 2017;117(9)Suppl 1.

PRACTICE CASE STUDIES:
DETERMINE THE SEVERITY AND TYPE OF MALNUTRITION

PATIENT 1
ADMITTED FOR CONGESTIVE HEART FAILURE

- EER is unknown

- Lost 4% of body weight in 1 month

- Severe muscle loss was identified in clavicle region (pectoralis major) and within shoulder region (deltoid)

- Handgrip strength is measurably reduced from last physician appointment 1 month ago

- Severe fluid accumulation was documented

PATIENT 2
ADMITTED FOR ACUTE PANCREATITIS

- Patient has consumed 60% of EER for 8 days

- Lost 2.5% of body weight in 1 week

- Mild subcutaneous fat loss was identified in the thoracic and lumbar region (ribs, lower back and mid-axillary line)

- No fluid accumulation was documented

ANSWER (PATIENT 1): Severe Chronic Malnutrition

ANSWER (PATIENT 2): Mild/Moderate Acute Malnutrition

Note: Although this patient's weight loss would be categorized in the severe acute malnutrition category, there must be two characteristics categorized as severe for a diagnosis of severe malnutrition.

PATIENT 3

ADMITTED WITH HYPOTENSION AND WEAKNESS

- Currently undergoing chemotherapy and radiation therapy for esophageal cancer
- Intake has decreased over the past 3 months
- Eating 50%-75% of EER via soft solids, liquids and oral nutritional supplements
- Lost 9% of body weight over 3 months
- Severe muscle loss identified in temporalis and deltoid muscles
- Moderate fat loss in orbital region and triceps

PATIENT 4

ADMITTED FOR INJURIES RELATED TO A MOTOR VEHICLE ACCIDENT

- Intake has been <75% of EER due to pain
- Has lost 3% of body weight over 2 weeks
- Mild muscle loss identified in trapezius muscle
- Mild fat loss of rib region
- No fluid accumulation was documented

ANSWER (PATIENT 3): Severe Chronic Malnutrition

ANSWER (PATIENT 4): Mild/Moderate Acute Malnutrition