

# Malnutrition Assessment



Presented by:

Betsy Gallant, RD, LD, CNSC

Nutrition Support Team

Digestive Disease Institute

Center for Human Nutrition



**Cleveland Clinic**

## Disclosure

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# Objectives



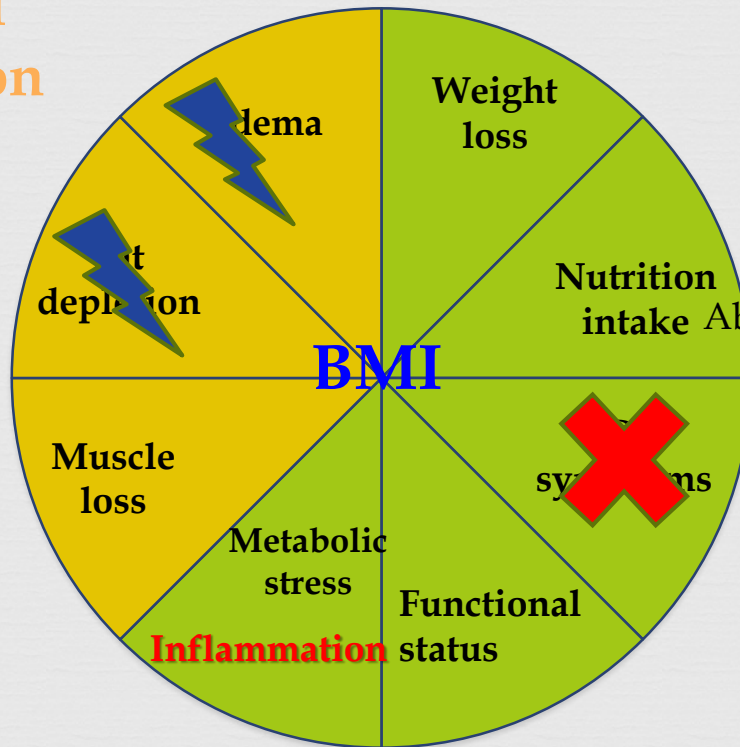
- Review The Academy/ ASPEN clinical characteristics and guidelines and updates for diagnosing malnutrition - GLIM
- Recognize the role of inflammation on malnutrition and etiology-based diagnoses
- Explain the impact of a NFPE as a necessary component to diagnosing malnutrition with The Academy/ ASPEN clinical characteristics
  - Challenges to NFPE
- Recognize possible clinical features of micronutrient deficiencies
- Review documentation and coding impacts

# Subjective Global Assessment (SGA)

## Academy / ASPEN Clinical Characteristics



3 components of physical examination



4 components of medical/nutrition history

Final rating: categorized summation of 8 components after presence of inflammation is determined / classified

- A = well nourished
- B = moderately malnourished
- C = severely malnourished



# Global Leadership Initiative on Malnutrition

## GLIM

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- ❧ Promote global use of criteria
  - ❧ Workgroup: ASPEN, ESPEN, FELANPE, PENSA
  - ❧ Criteria that would not be largely influenced by cultural differences
  
- ❧ Two-Step Approach
  - ❧ Validated Screening
  - ❧ Comprehensive Assessment for diagnosis and severity grading



Risk Identified

- Validated Screening Tool



Assessment

- GLIM Criteria
  - Phenotypic :
    - Non-volitional Weight Loss
    - Low BMI
    - Reduced Muscle mass (strength)
  - Etiologic
    - Reduced Food Intake or Assimilation (malabsorptive / mechanical complications)
    - Disease Burden / Inflammation



Diagnosis

- Meets at least 1 Phenotypic Criteria and 1 Etiologic Criteria



Grading

- Severity based on Phenotypic Criteria

# What's the Difference??

SGA		Academy / ASPEN Characteristics
<b>Weight Changes*</b>	✓	- % of change over time - compared to USUAL
<b>Nutrition Intake*</b>	✓	- % of change over time - compared to estimated NEEDs
Eval of GI Symptoms		✗
Eval Functional Status	✓	Hand-grip strength
<b>Fat Stores*</b>	✓	eyes, upper arms, mid-axillary line
<b>Muscle Wasting*</b>	✓	temporalis, pectoralis/deltoids/trapezius, interosseous, quads/gastrocnemius
Edema/ Ascites	✓	extremities, sacral/scrotum/labial
Disease Process/Metabolic Stress	✓	characteristics as part of over arching inflammatory process

\***most important**

White et al, Consensus Statement, JPEN 2012

Detsky AS, McLaughlin JR, et al. What is subjective global assessment? JPEN, 1987.

# Academy/ ASPEN Clinical Characteristics

**Nutritional Risk Identified**  
Compromised intake or loss of body mass.  
Screen - (MST)<sup>(2)</sup>

1 Jensen GL. JPEN 2009;33:710

**Inflammation present?**

**No**

**Yes**  
Mild - Moderate Degree

**Yes**  
Marked Response

**Starvation Related  
Malnutrition**

**Chronic Disease – Related  
Malnutrition**

**Acute Disease or Injury-  
Related Malnutrition**

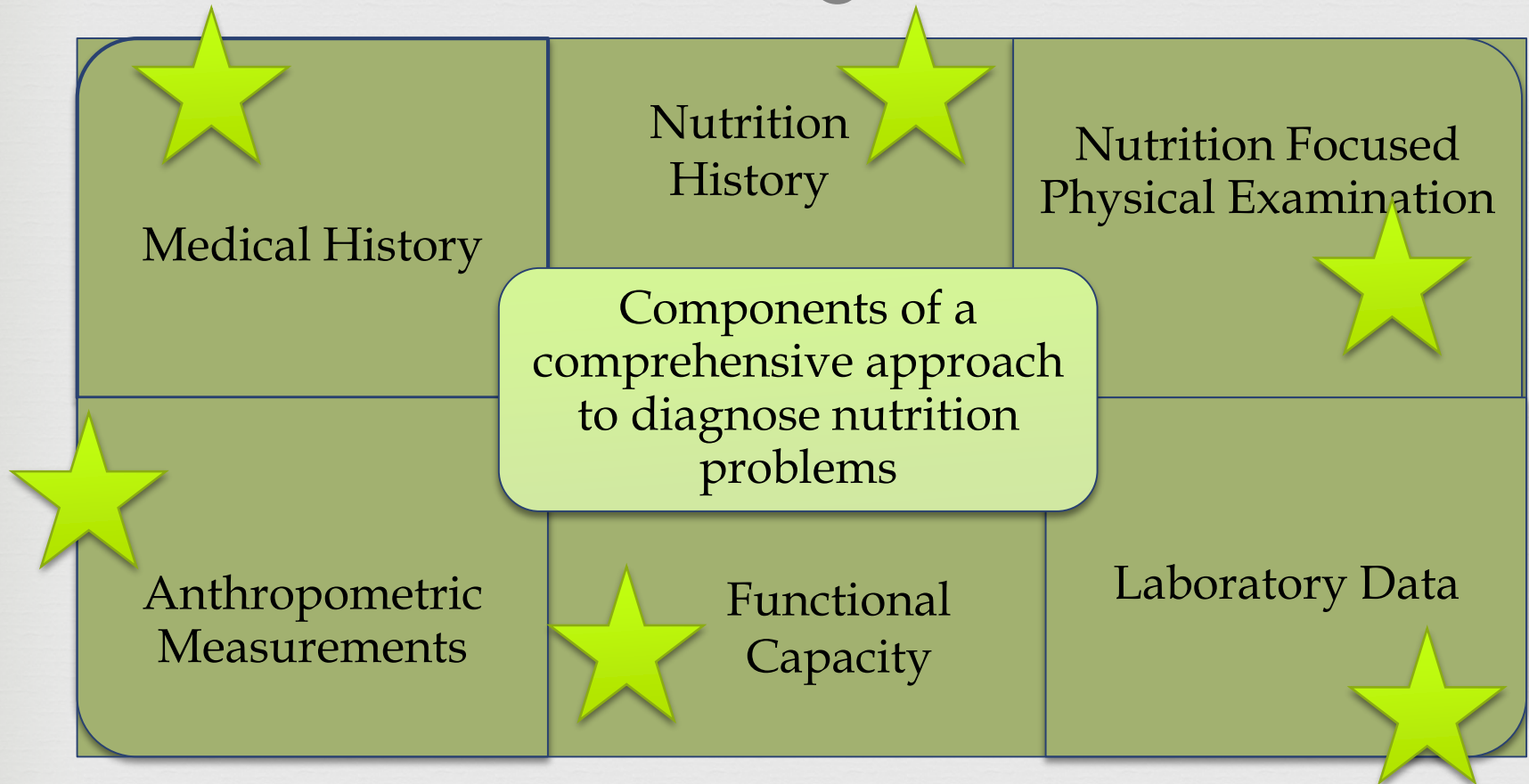
Energy Intake, Weight Loss, Body Fat, Muscle Mass, Fluid Accumulation,  
Hand Grip Strength

**Final rating:** based on presence / severity of at least 2 (of 6) characteristics

2. [https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-hp-pdq#section/\\_74](https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-hp-pdq#section/_74)



# Nutrition Assessment Components



# Etiologies of Malnutrition



# Review of Etiologies



**Social/Environmental/Behavioral**

~No inflammation

**Chronic Illness**

~Mild to moderate inflammation

**Acute Illness or Injury**

~Severe inflammation

# What is Inflammation?



## ∞ Definition:

- increased concentrations of inflammatory mediators.

## ∞ Acute inflammation

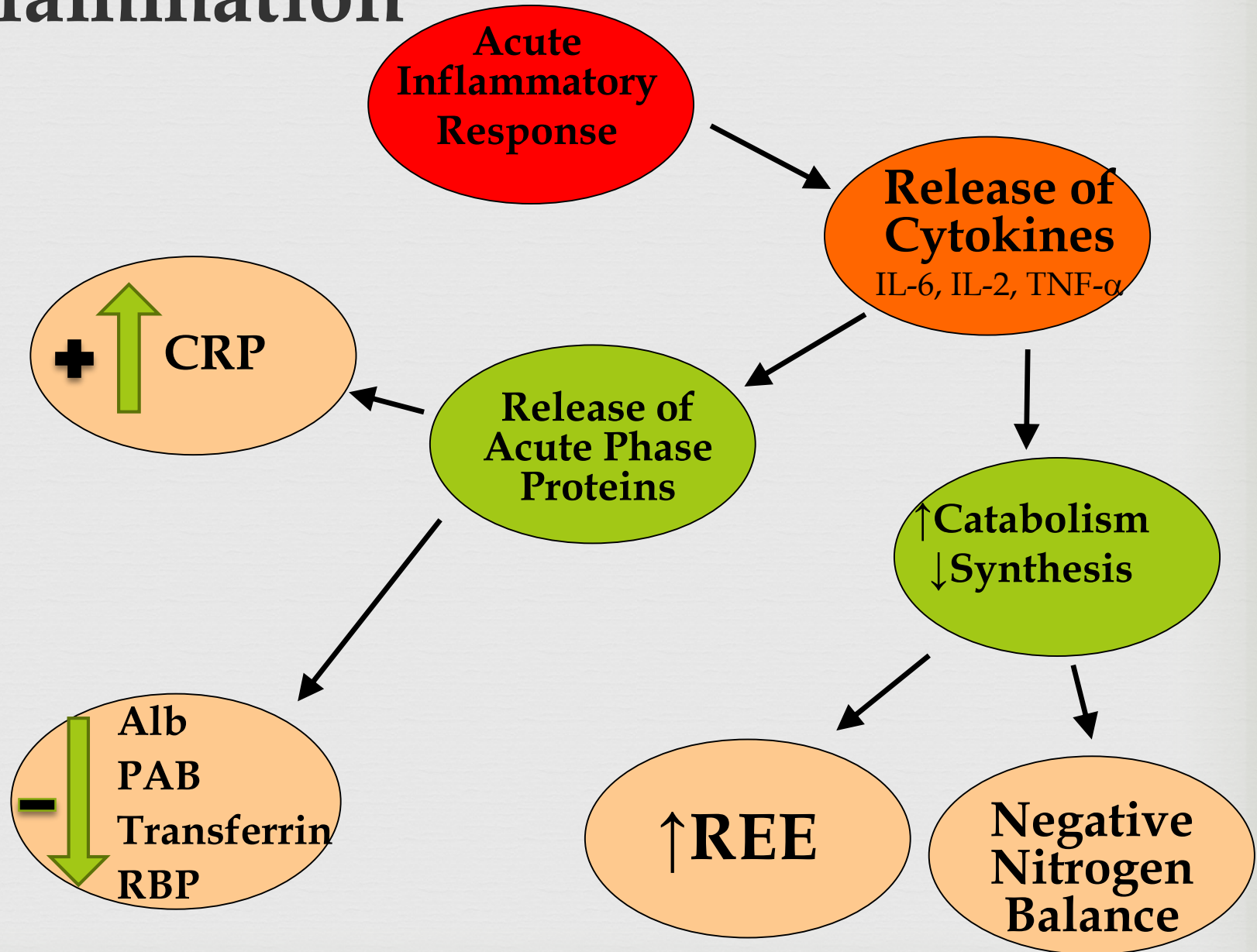
## ∞ Chronic inflammation

## ∞ Explanation of importance - effect on malnutrition

- increase risk or worsening of the severity of malnutrition
- acute condition: decreased response to nutrition interventions and nutrient utilization and potentially increase mortality



# Inflammation



# Inflammatory Process

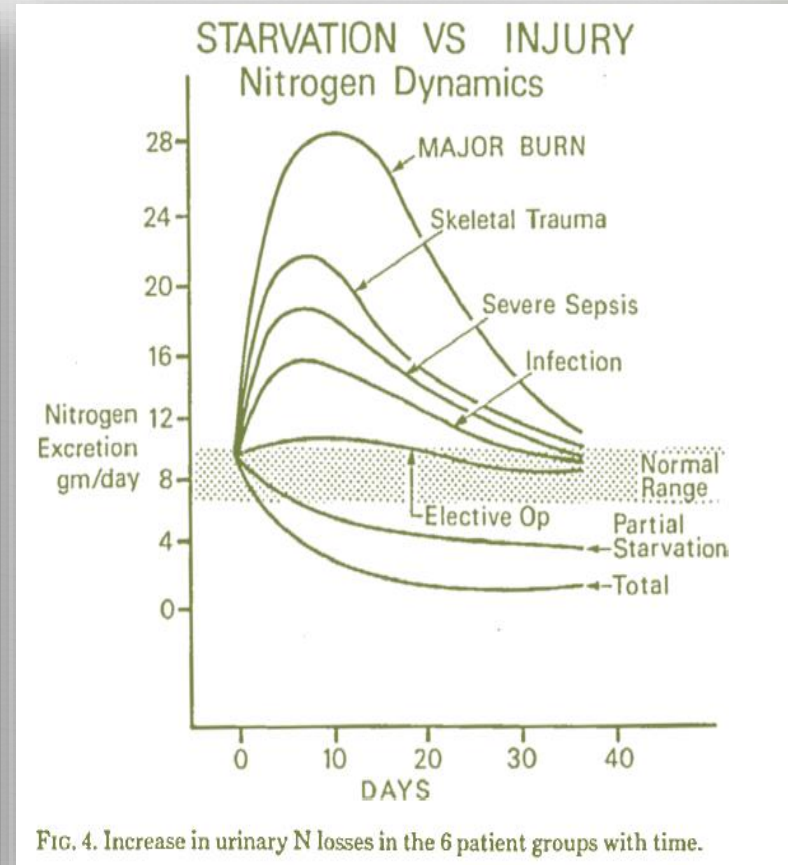
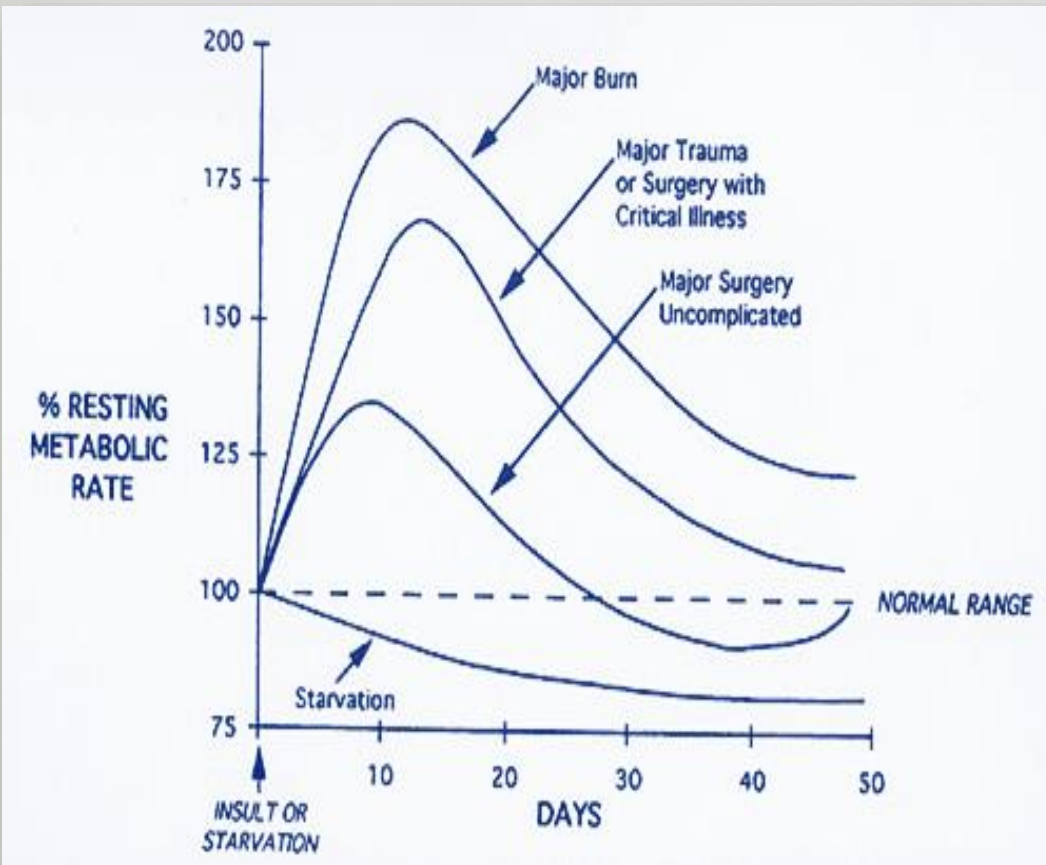


FIG. 4. Increase in urinary N losses in the 6 patient groups with time.

# Social/Environmental/Behavioral Circumstances

~no inflammation~



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## **Chronic starvation without inflammation**

*anything that limits access to food*

Examples:

Anorexia nervosa

Economic hardship

Cognitive or emotional impairment

Inability or lack of desire to manage self-care

Physical conditions: achalasia, ingestion of foreign bodies

Poor oral/dental condition

# Chronic Illness

~mild to moderate inflammation~



**Inflammation is chronic and of mild-moderate degree**

- no classic signs of inflammation and minor CRP elevation
  - purpose: restorative and homeostasis
- Smoldering, slow burning condition

- |   |                        |
|---|------------------------|
| • Organ failure<br>(kidney, liver, heart,<br>lung, gut) | • CHF                  |
| • Cancer  | • Cystic fibrosis      |
| • Rheumatoid arthritis                                  | • Celiac disease       |
| • Cardiovascular<br>disease                             | • IBD                  |
|   | • CVA                  |
|   | • Chronic pancreatitis |
|   | • DM                   |



# Acute Illness or Injury ~severe inflammation~



## Inflammation is acute and of severe degree

- swelling, erythema, hyperthermia, pain and marked CRP elevation
- purpose: defense, clearance, adaptation and repair

**Intense burning raging fire**

Examples:

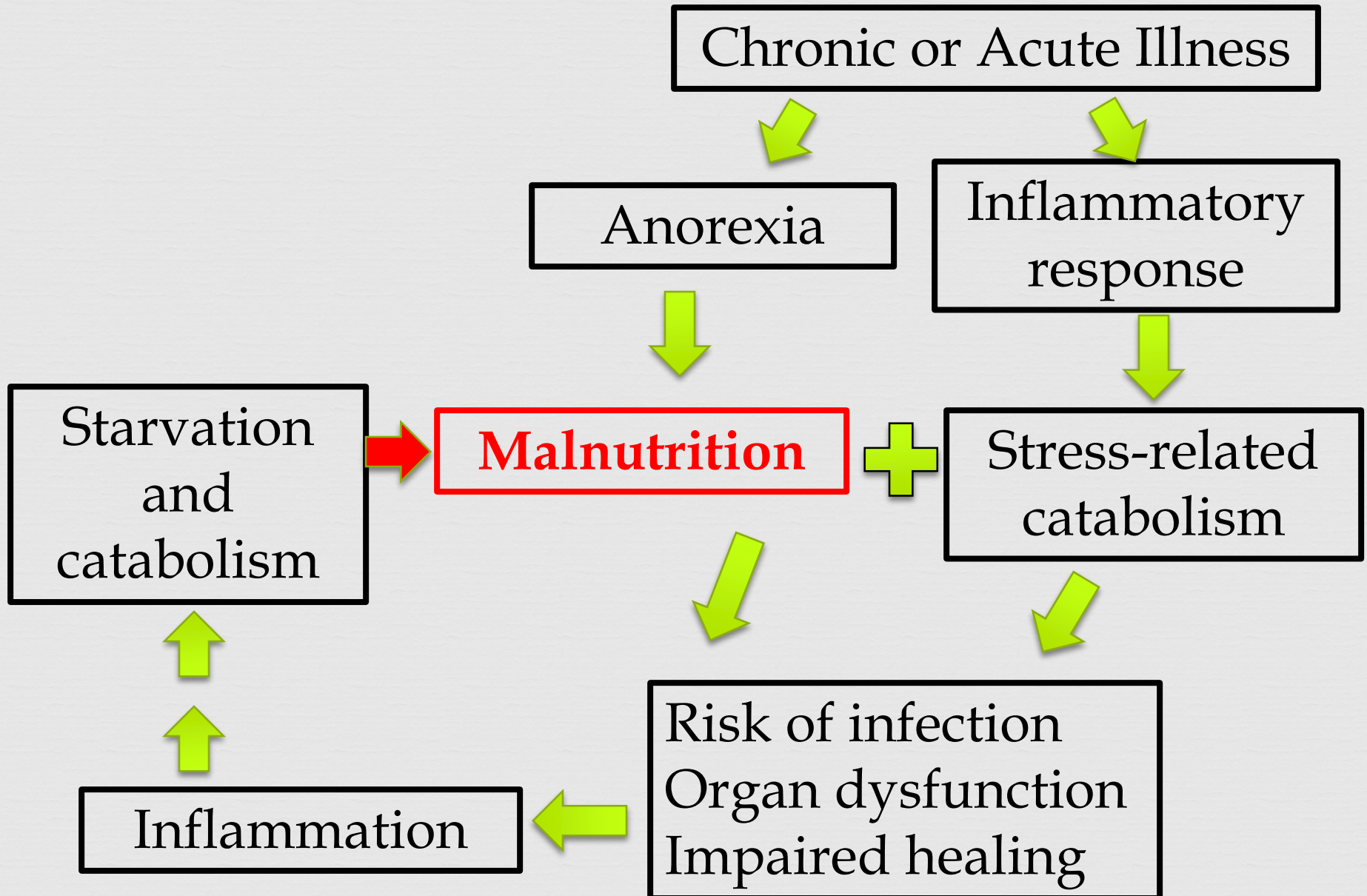
Major infection/sepsis

ARDS, burns, trauma

Closed head injury

Major surgery (any surgery that involves a major organ)

# Development of Malnutrition in Disease



# Acute vs Chronic

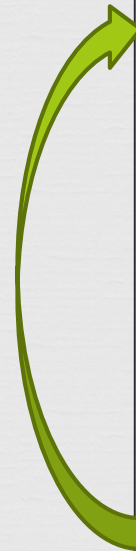
## Acute Inflammation

- Stimulus
- Major inflammatory response
  - Fever, swelling, tachycardia, leukocytosis
- Resolution → healing or death



## Chronic Inflammation

- Stimulus
- Inflammatory response
- Stimulus continues
- Low level inflammatory response
- Stimulus continues/repetitive



# Indicators of possible inflammatory processes



## Biochemical Markers

- ❧ depleted serum proteins (acute phase reactants)
- ❧ elevated CRP
- ❧ hyperglycemia
- ❖ white blood cell count (both high and low)
- ❖ nitrogen balance

## Microbiological indicators

- cultures
- blood stream infections
- gastrointestinal infections
  - fecal cultures
  - sputum cultures
- bodily fluid cultures
  - ascites
  - pleural fluid
  - wound infections



# Indicators of possible inflammatory processes



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## Imaging Studies

- Chest x-ray
  - Pneumonia/infiltrations
- Abdominal/pelvis x-ray
  - Abscess, pancreatitis, bowel obstruction
- Gastric emptying study/  
small bowel follow through
  - gastroparesis, dysmotility
- EGD/colonoscopy
  - IBD, radiation enteritis, strictures
- Transesophageal echo (TEE)
- Vegetations, endocarditis

# Indicators of possible inflammatory processes



## Vital signs

- fevers- hyper or hypothermia
  - $\geq 37.7$  C (99.9 F) or  $< 35.0$  C (95.0 F)
- Tachycardia ( $> 100$  bpm)

## Inspection

- Skin: red, rash, swelling, wounds, burns, heat
- Eyes: discharge/swelling
- Nose: discharge
- Mouth/gums: red/swollen
- Miscellaneous: chills, night sweats, pain with urination, productive cough

# Final Thoughts

## Inflammatory process at the moment of assessment

- ☞ Only choose *one* etiology at a time

Etiology is changeable



- ☞ Degree of inflammation > Duration of inflammation

There are no “rules” -- rather guidelines

- ☞ No 1 lab marker/ disease process defines inflammation
- ☞ Honor the big picture
- ☞ It is ok to use No Malnutrition or Unable to determine

Malnutrition



Characteristics &  
Severity



# 'MALNUTRITION' GETTING IT RIGHT



Academy and A.S.P.E.N.



Recommend a set 6 of standardized, diagnostic characteristics to identify and document adult malnutrition in clinical settings.

# 6 Characteristics



- ∞ Energy intakes
- ∞ Weight loss - unintentional
- ∞ Fat loss
- ∞ Muscle loss
  
- ∞ Edema
- ∞ Hand grip strength/functional status

# Diagnostic Criteria: Energy Intake

		Moderate	Severe
<b>Acute Illness</b> 	$< 75\%$	$> 7$ days	$\leq 50\%$ $\geq 5$ days
<b>Chronic Illness</b> 	$\leq 75\%$	$\geq 1$ mo	$< 75\%$ $\geq 1$ mo
<b>Social / Environmental</b>	$< 75\%$	$\geq 3$ mo	$\leq 50\%$ $\geq 1$ mo

# Diagnostic Criteria: Weight Loss



- ❧ Historically used as common identifier of malnutrition and poor prognosis
  
- ❧ New guidelines
  - ❧ Type of loss (lean/fluid)
  - ❧ Time of weight loss
  - ❧ Classification of severity



# Diagnostic Criteria: Weight Loss

	Acute Illness		Chronic Illness		Social/ Environment	
<b>1 week</b>	1-2%	>2%	N/A		N/A	
<b>1 mo</b>	5%	>5%	5%	>5%	5%	>5%
<b>3 mo</b>	7.5%	>7.5%	7.5%	>7.5%	7.5%	>7.5%
<b>6 mo</b>	N/A		10%	>10%	10%	>10%
<b>1 year</b>	N/A		20%	>20%	20%	>20%

Moderate Weight loss = Blue  
Severe Weight Loss = Red

# Physical Exam Diagnostic Criteria

## ❖ Body Fat

- Subcutaneous fat
  - Orbital
  - Triceps
  - Mid-axillary/Rib Cage

## ❖ Muscle Mass

- Eval of somatic protein stores
  - Facial
  - Upper body
  - Lower body

## ❖ Fluid Accumulation

- Large wt changes over short time periods
- Edema
  - Generalized
    - Anasarca
  - Localized
    - Extremities
    - Ascites

# Diagnostic Criteria: Functional Status



- ∞ Hand-grip strength
- ∞ Overall energy, strength, endurance
- ∞ Ability to perform activities of daily living
- ∞ Patients' perception of any change in functional level:
  - Physically sick
  - Neurologic condition
  - Pain
  - Medications
  - Nutrition

*Not all decline is related to nutrition status*

# Lab Indices



No inflammatory markers are currently recommended for use as malnutrition diagnostic markers

Serum levels of albumin & prealbumin do not consistently / predictably change in response to changes in weight, nutrient intake, nitrogen balance

- Academy Evidence Analysis Library



# Feasibility of Assessing Characteristics



Characteristic	Availability			Used to Define Malnutrition
	All	non-ICU	ICU	
Energy Intake	76.4%	76.7	76.4	34.6%
Weight Loss	66.5%	75.3*	54.5*	51.3%
<b>Fat Loss</b>	<b>93.9%</b>	92.9	95.5	27.4%
<b>Muscle Mass Loss</b>	<b>93.5%</b>	92.3	95.5	25.9%
Edema	84.4%	85.9	82.7	26.6%
Handgrip Strength	~ not measured ~			not measured

\* P < 0.05

# Diagnosing Malnutrition: Steps

## **Determine Etiology:**

Social / Environmental/Behavioral  
Chronic Illness  
Acute Illness or Injury

## **Determine Characteristics:**

Insufficient Energy Intake, Weight Loss  
Muscle Loss, Fat Loss  
Fluid Accumulation, ↓ Functional Status

**≥ 2 Characteristics Present?**

**NO**

**NO MALNUTRITION IDENTIFIED**

**YES**

**MODERATE  
MALNUTRITION**

**SEVERE PROTEIN-CALORIE  
MALNUTRITION**

# Considerations When Applying Characteristics

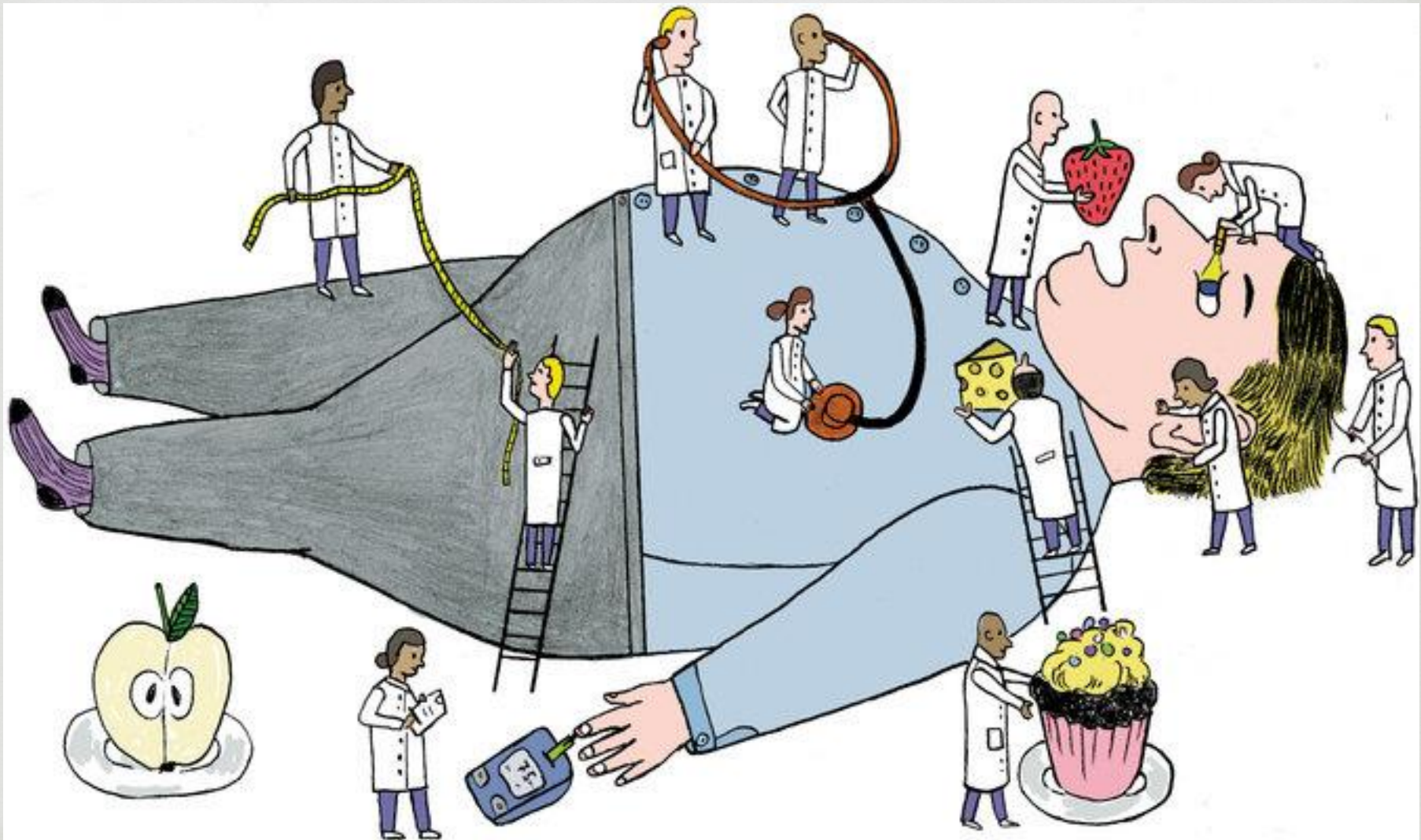
- ❧ Use your **clinical judgment**
- ❧ Characteristics should be **routinely assessed** at frequent intervals
- ❧ **Ok to defer judgment** & reassess later
- ❧ **Nutrition status may change** as clinical course changes
- ❧ **Etiology may change** as clinical course changes
- Characteristics may be present without malnutrition (i.e.: edema)
- Characteristics may not be present at high risk for malnutrition (i.e.: trauma)
- Edema, functional status, muscle & fat loss should all be **nutrition-related**

# Nutrition Focused Physical Exam





# Components of the NFPE



# Nutrition-Focused Physical Exam



- Exam which uses physical assessment and its findings to help determine nutritional status and diagnose malnutrition
- Components
  - Macronutrient- **Fat** (orbital, triceps, ribcage) **Muscle** (temples, shoulders, clavicles, scapula, hand, thigh, calves)
  - Micronutrient- Skin, Nails, Hair, Head/neck, Oral cavity, Eyes, Nose/Face

# How to Do it

## Techniques of the Physical Exam

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### ∞ Inspection

- ∞ Broad observation
- ∞ Critical Evaluation
- ∞ Symmetry

### ∞ Palpation

- ∞ Examining body structures - touch

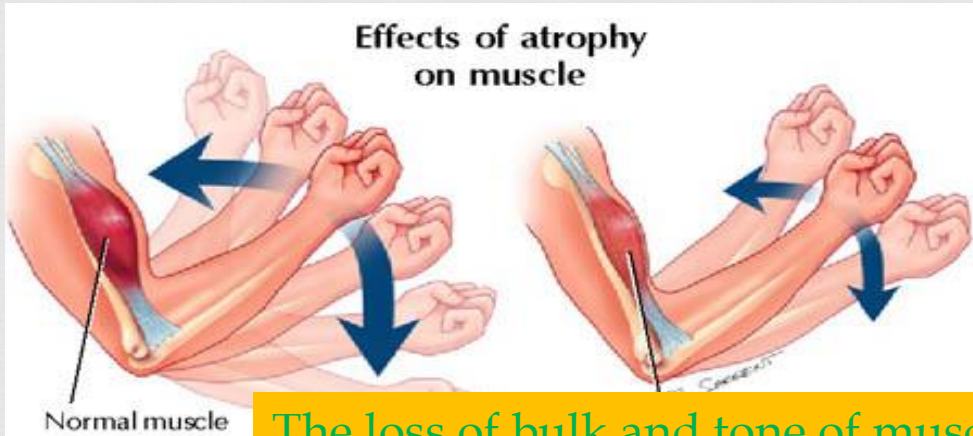


# Getting Started...





# Things to Consider: Etiology of Muscle Wasting



The loss of bulk and tone of muscle may not affect the person in a non-inflammatory state, yet presenting in a more compromised position with lower muscle mass will have further reduction of muscle mass in critical illness."

Fig. 1



# Causes of Muscle Atrophy



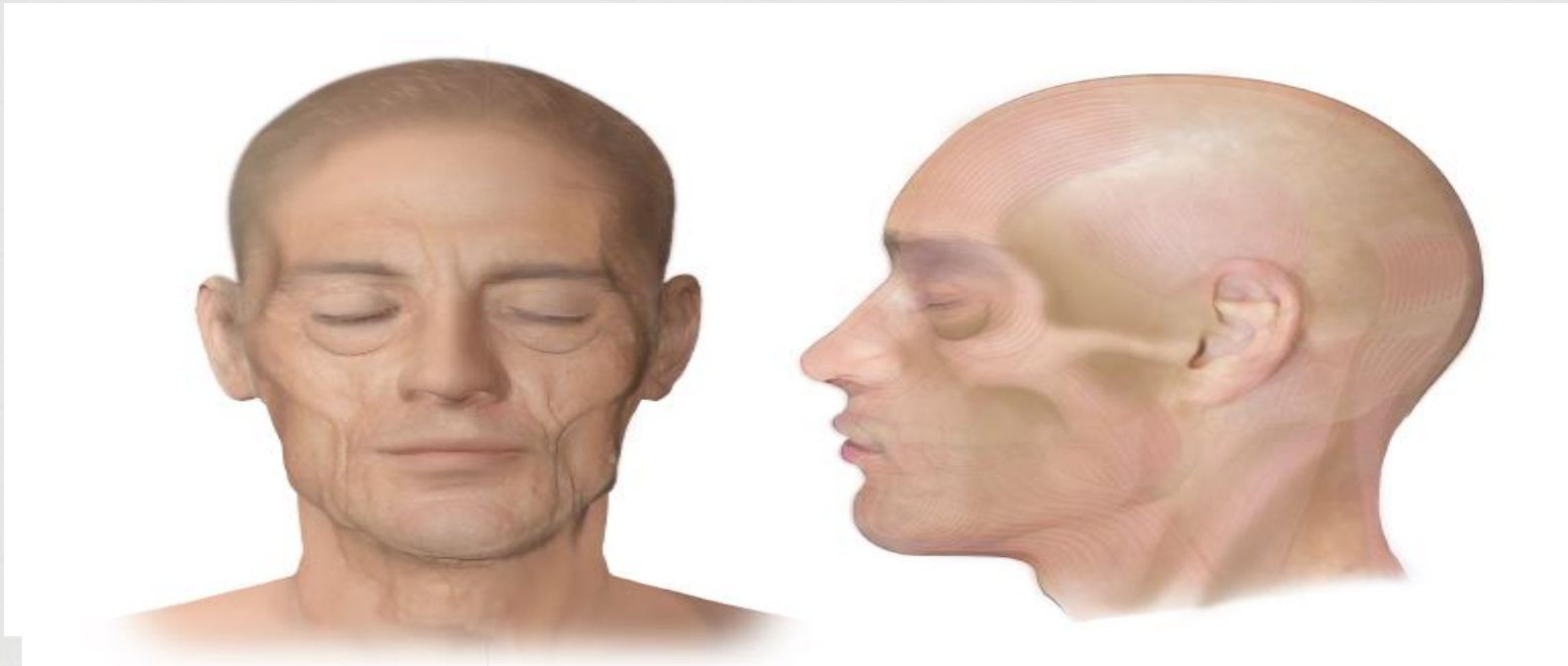
- ❧ Amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease)
- ❧ Polio
- ❧ Guillain-Barre Syndrome
- ❧ Motor Neuropathy (such as diabetic neuropathy)
- ❧ Injury
- ❧ Burns
- ❧ Long-term corticosteroid therapy
- ❧ Muscular dystrophy
- ❧ Not moving (immobilization)
- ❧ Osteoarthritis
- ❧ Dermatomyositis and polymyositis
- ❧ Rheumatoid arthritis
- ❧ Spinal cord injury
- ❧ Stroke
- ❧ **Malnutrition**

# Things to Consider: Symmetry





# Orbital and Temple Regions

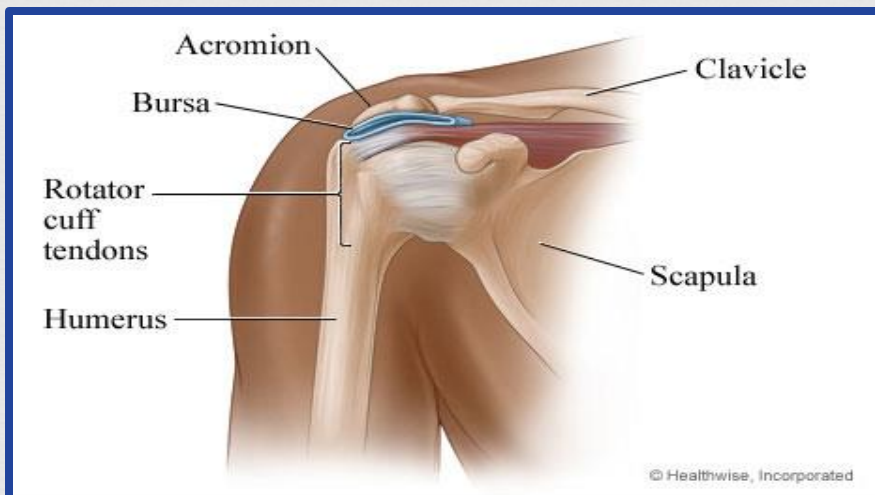
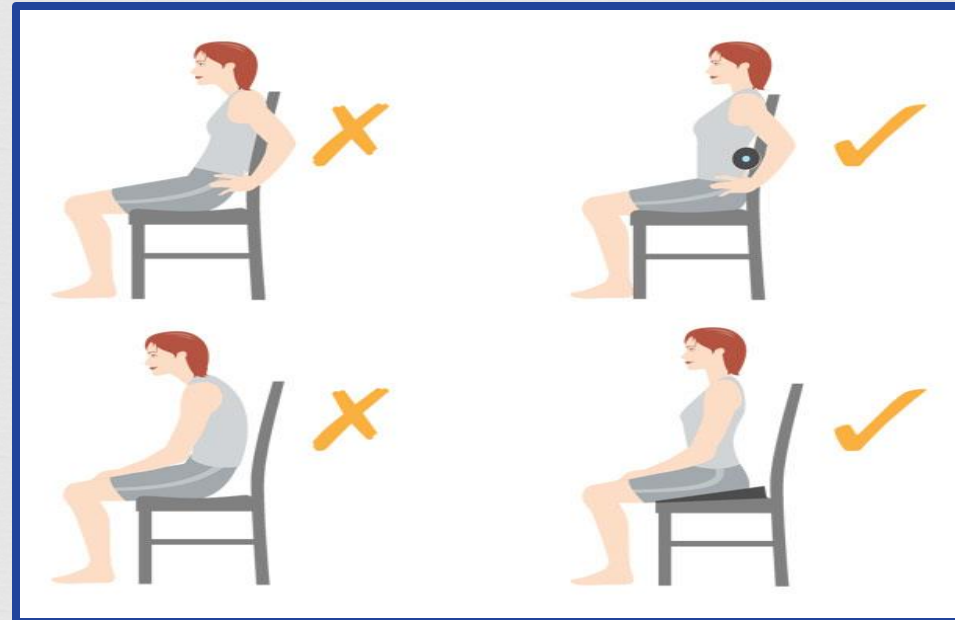
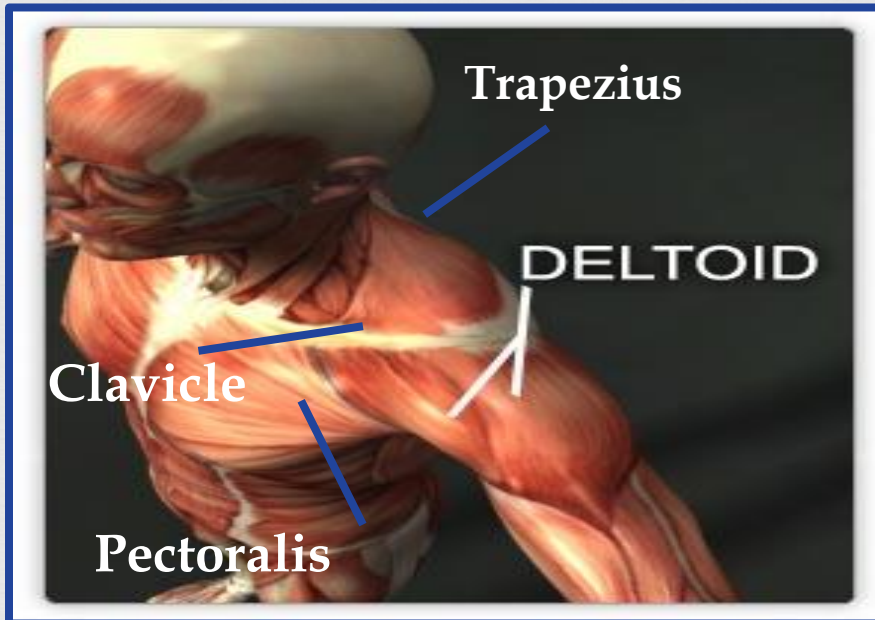


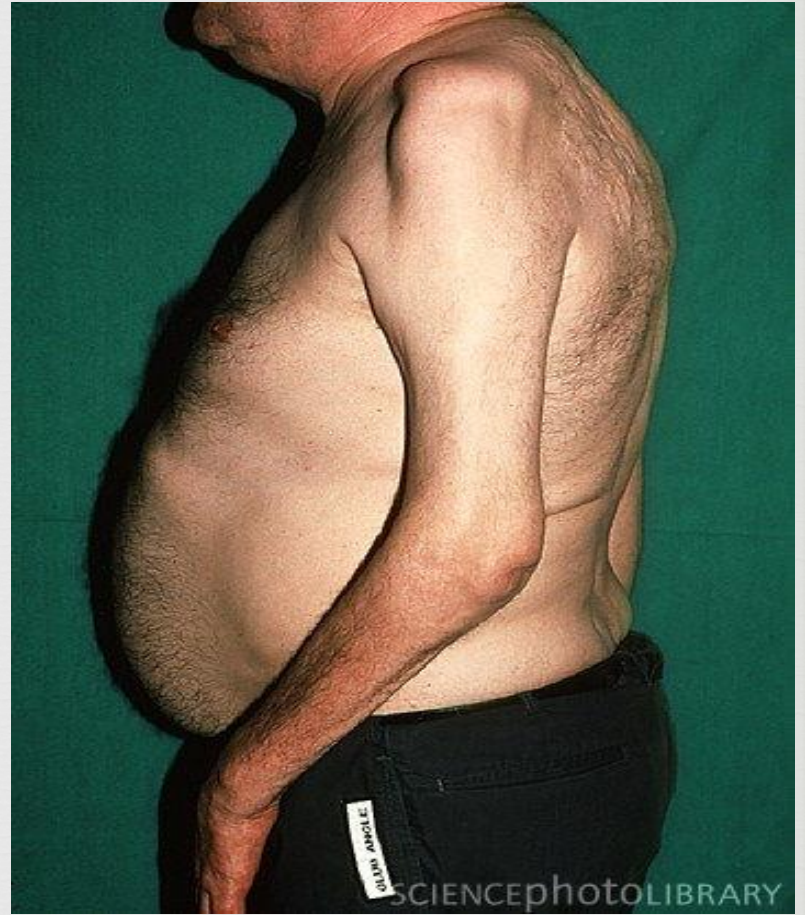
Orbital Region: Orbital Fat  
Pads **[fat exam area]**

Temple Region: Temporalis  
Muscle **[muscle exam area]**



# Clavicle Bone Region (Pectoralis Major, Deltoid, Trapezius) [Muscle Exam Area]





# Clavicle Bone Region (Pectoralis Major, Deltoid, Trapezius)

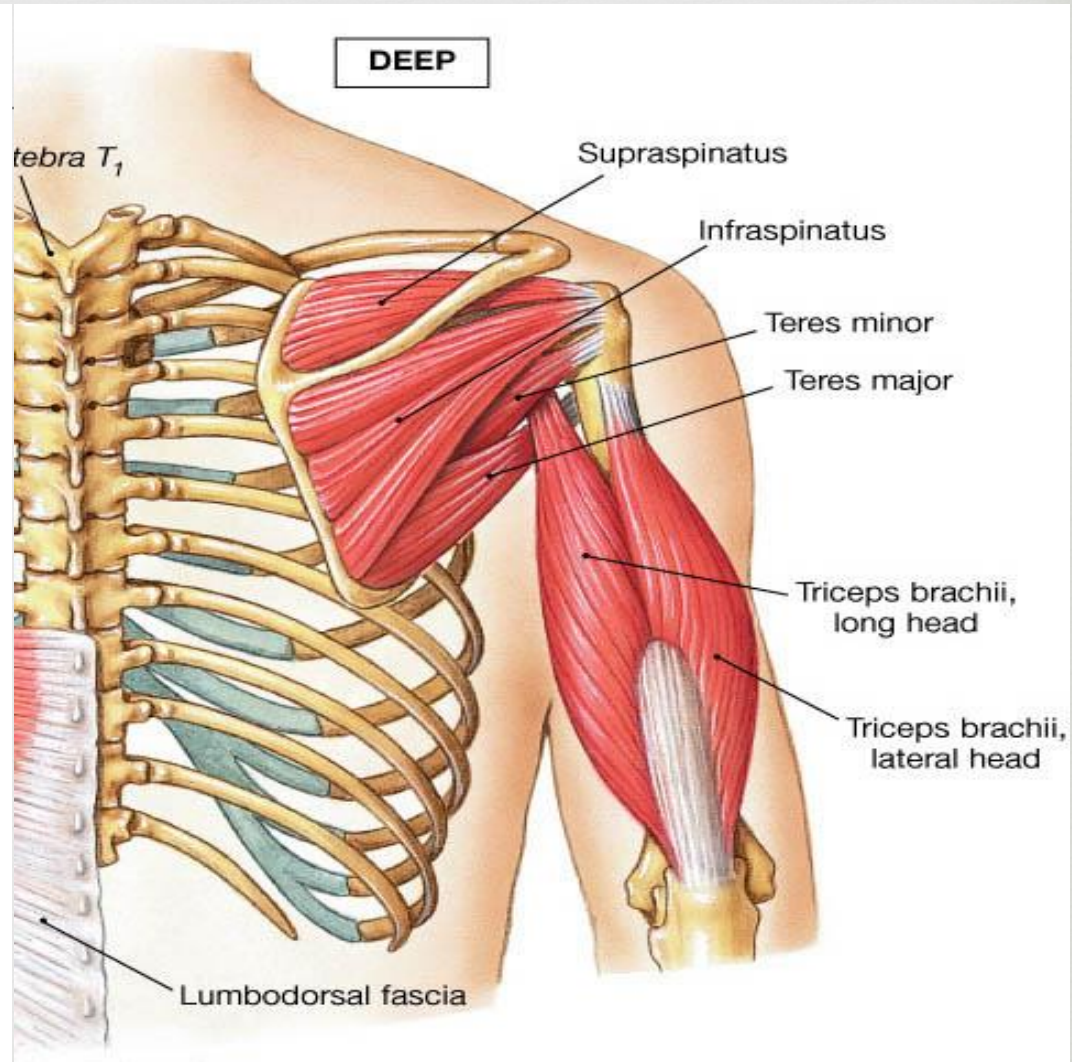
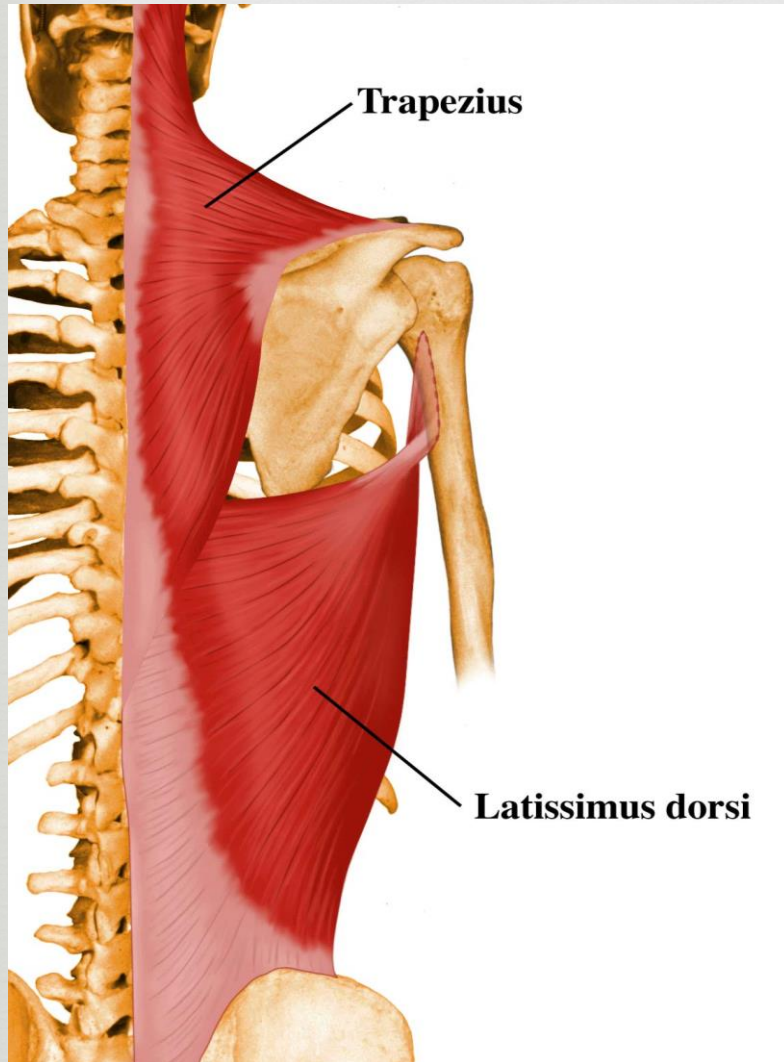








# Scapular Region: Trapezius, Supraspinatus, Infraspinatus



# Exam Areas: Scapular Bone Region (Trapezius, Supraspinatus, Infraspinatus) [Muscle exam area]



**NORMAL**

-bones not prominent, no significant depressions

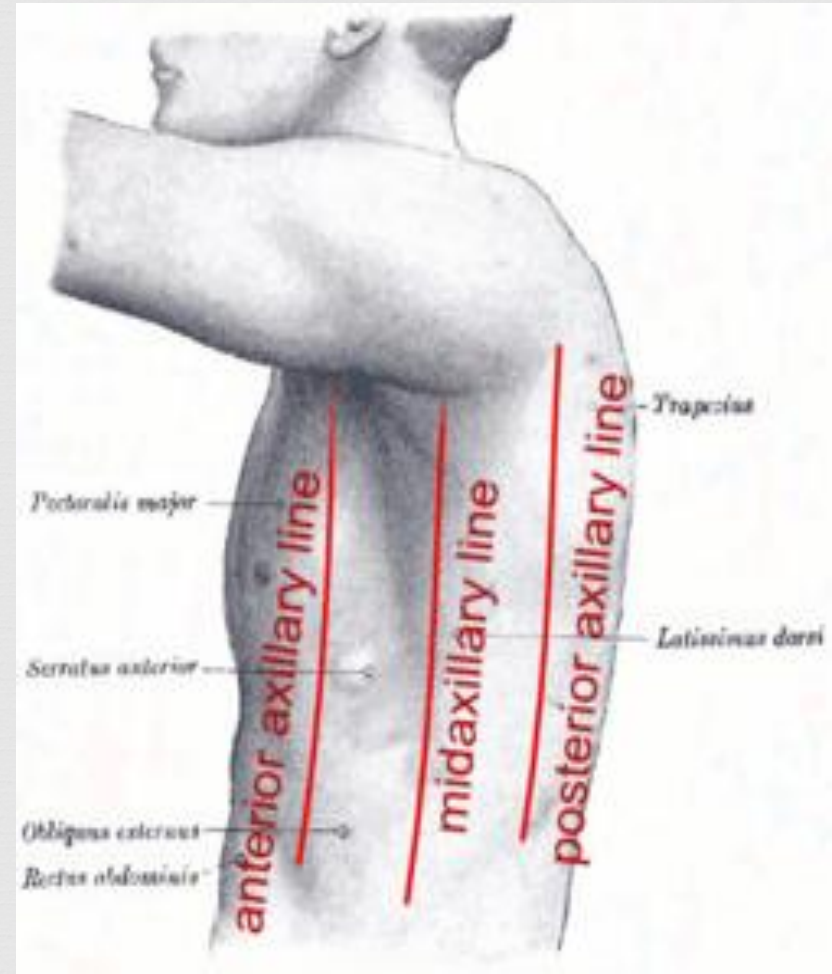
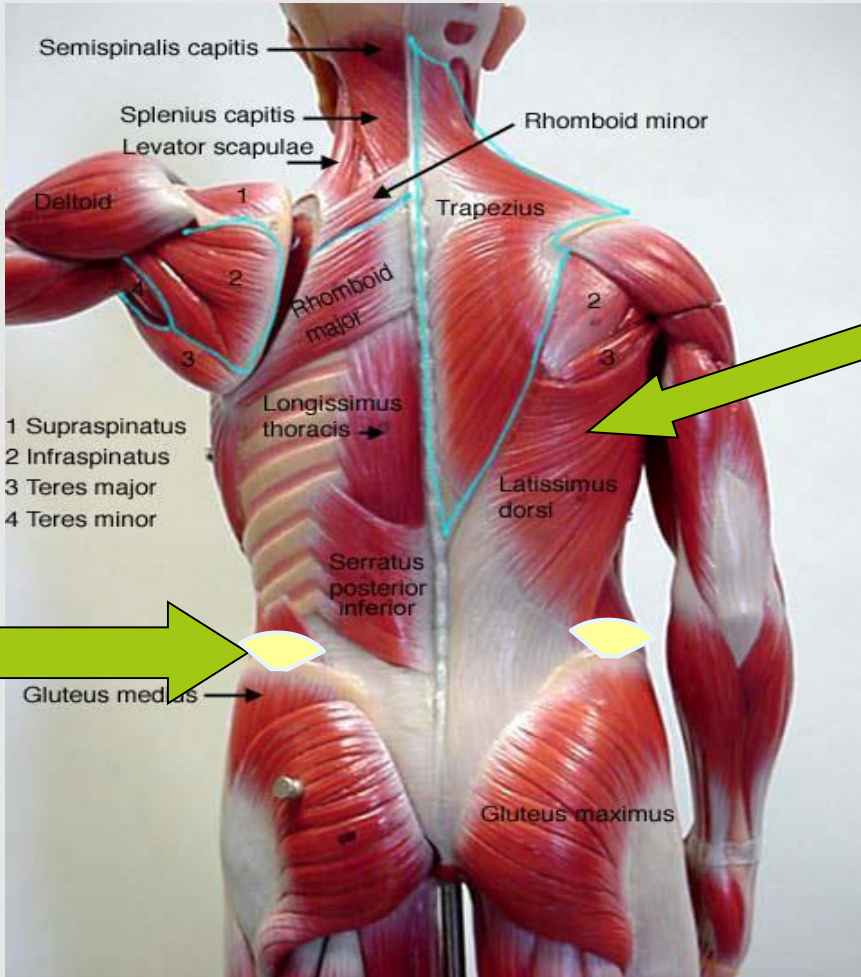


# Scapular Bone Region





# Thoracic and Lumbar Region: Latissimus Dorsi, Lower Back, **Midaxillary** [fat exam area]





# Thoracic and Lumbar Region: Ribs, Lower Back, Midaxillary Line

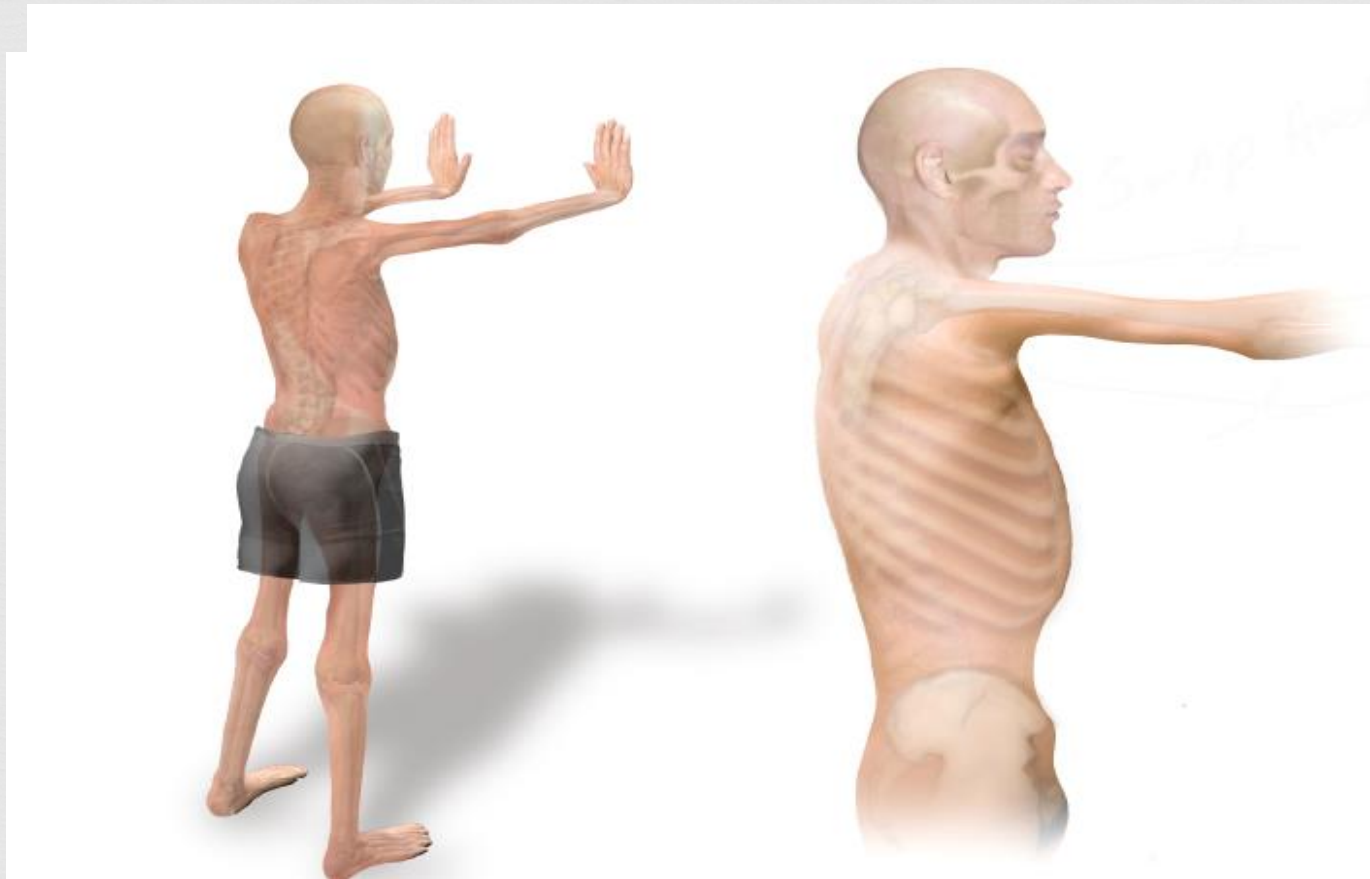


**NORMAL**



-chest is full, ribs do not show, slight to no protrusion of the iliac crest

# Thoracic and Lumbar Region



# Upper Arm Region

## Triceps

[Fat exam area]



**NORMAL**

-ample fat tissue obvious between folds of skin



# Upper Arm Region - Triceps





# Interosseous Muscles

[Muscle exam area]



Dorsal



Palmar

# Anterior Thigh Region: Quadriceps

## [Muscle exam area]



### NORMAL

- well rounded, well developed
- patellar region: muscles protrude, knee cap not prominent

# Anterior Thigh Region: Quadriceps



# Posterior Calf Region: Gastrocnemius

## [Muscle exam area]



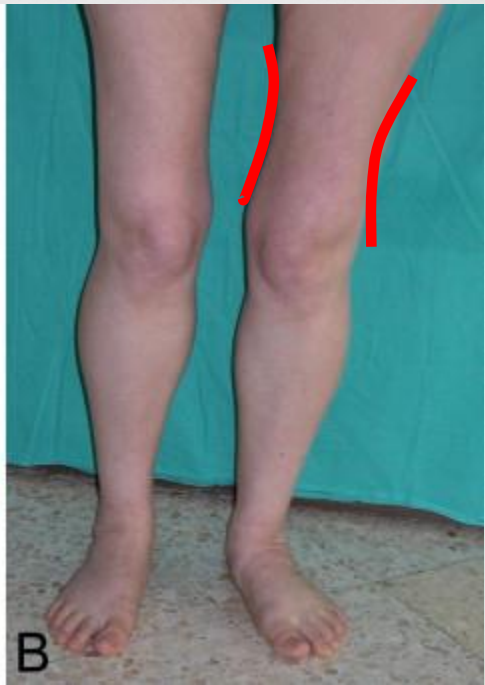




**SEVERE**



**MILD - MODERATE**



Fluid Accumulation



Functional Status

# Fluid Accumulation/Edema



Abnormal retention of fluid in interstitial spaces and cavities (e.g., peritoneal/abdominal cavity)

Can result in palpable swelling

Clinical manifestation:

- At least 10% of body weight
- volume increased by 2.5-3 liters

Seen on imaging studies



# Etiology & Disease States Associated with Edema

Etiology	Disease States	Signs/Symptoms
<b>Increased Hydrostatic Pressure</b>	<b>Renal failure</b> <b>Heart failure</b> <b>Cirrhosis</b> <b>Sodium / fluid overload</b> <b>Venous obstruction</b>	<b>Bilateral pitting edema, SOB, possibly ascites</b>  <b>Unilateral pitting edema, erythema, tenderness</b>
<b>Decreased capillary osmotic pressure</b>	<b>Nephrotic syndrome</b> <b>Protein-losing enteropathy</b> <b>Liver disease</b> <b>Severe malnutrition</b>	<b>Bilateral pitting edema, ascites</b>
<b>Increased capillary permeability</b>	<b>ARDS</b> <b>Trauma</b> <b>Burns</b> <b>Inflammation/Sepsis</b> <b>Malignancy</b>	<b>Bilateral pitting edema</b>
<b>Lymphatic dysfunction</b>	<b>Malignancy</b> <b>Lymph node dissection</b>	<b>Unilateral or bilateral non-pitting edema</b>

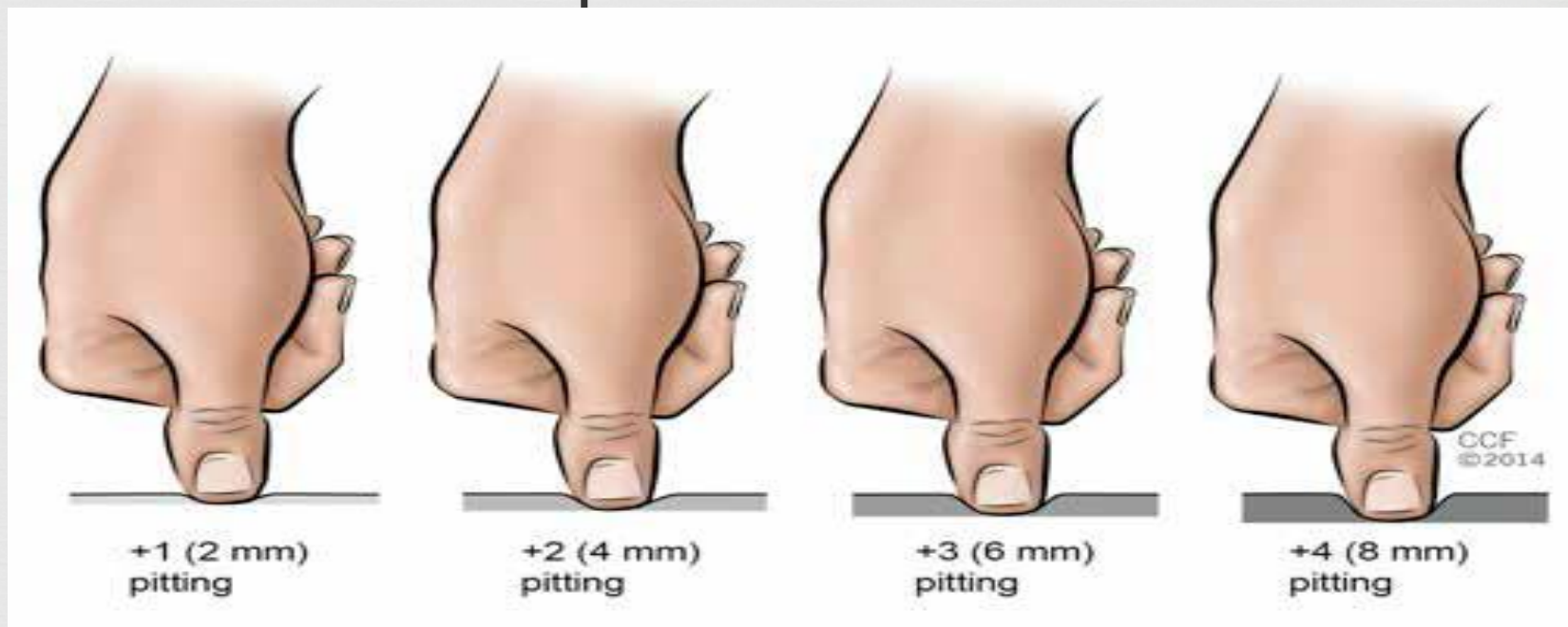


# Descriptive Terminology of Edema



- ❧ **Ascites:** accumulation of fluid in the abdomen or inside the peritoneal cavity
- ❧ **Anasarca:** massive, generalized edema
- ❧ **Peripheral Edema:** fluid accumulation in tissues perfused by peripheral vascular system, usually lower extremities; can cause ambulating difficulties
- ❧ **Pitting Edema:** leaves indentation when at least 5 seconds of pressure is applied to edematous area
- ❧ **Non-Pitting Edema (aka Brawny Edema):** no indentation is created after pressure is applied to the edematous area

# Subjective Grading and Severity of Pitting Peripheral Edema



Grade	Severity	Pitting Depth	Refill Time
+1	Mild	0 to ¼ inch	<10 seconds
+2	Moderate	¼ to ½ inch	10 to 15 seconds
+3	Severe	½ to 1 inch	1 to 2 minutes
+4	Severe	>1 inch	≥5 minutes

# Dependent Edema

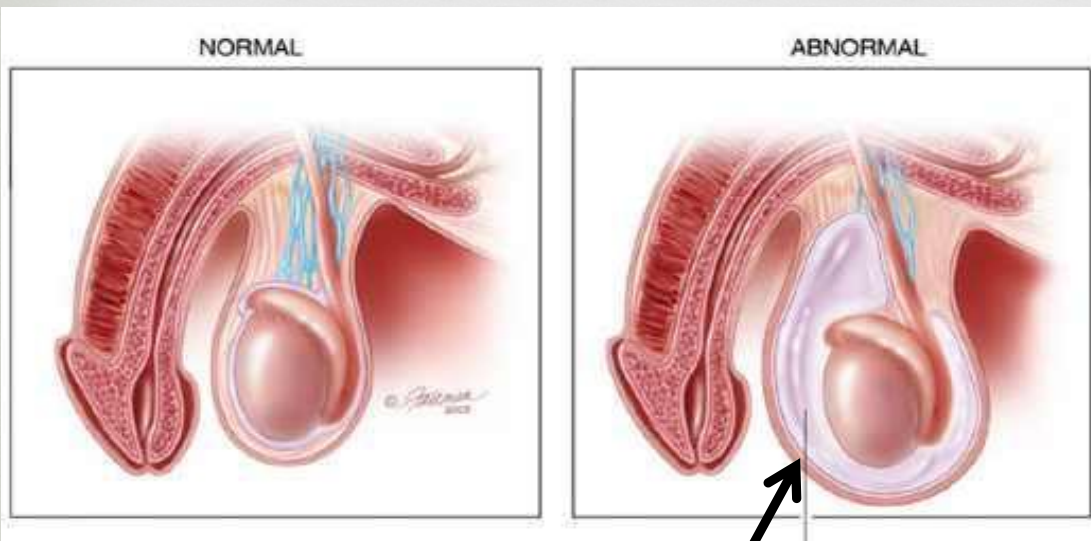
ambulatory patients: legs, ankles, feet





# Dependent Edema

bed bound patients: scrotum, labia, sacrum





# How is Fluid Accumulation Used as a Characteristic of Malnutrition?



Context	Acute Illness or Injury		Chronic Illness <u>or</u> Social / Environmental Circumstances	
	Moderate	Severe	Moderate	Severe
Malnutrition	Moderate	Severe	Moderate	Severe
Edema	Mild	Moderate to severe	Mild	Severe

- ✎ Edema will deceptively increase weight/mask real bodily weight loss
- ✎ If substantial, can mask evaluation of muscle/fat loss
- ✎ Usually **SUPPORTIVE** evidence
  - RARELY direct result of malnutrition

# Assessment of Functional Status



- ❧ SGA: assessed functional capacity
  - ❧ No dysfunction (full capacity)
  - ❧ Dysfunction
- ❧ Many other nutrition assessment tools
  - ❧ Functional status not accounted for
- ❧ Academy/ ASPEN characteristics: assessment of function
  - ❧ HGS (hand grip strength) with dynamometer
    - ❧ Overall energy, strength, endurance
    - ❧ Ability to perform ADLs, wean from vent
    - ❧ Wound healing



# Functional Status HGS by dynamometers



## Strengths

- ❧ HGS associated with malnutrition
- ❧ Correlates well with muscle function tests
- ❧ Simple, easy to learn
- ❧ Ok for ambulatory or bedridden pts

## Clinical Limitations

- ❧ Cost of device
- ❧ Portability
- ❧ Ineligible patients:
  - ❧ Critically ill
  - ❧ Stroke/ AMS
  - ❧ Spinal injuries or any injuries affecting posture and gripping

# Academy / ASPEN Functional Status Assessment



Etiology of Malnutrition	Nonsevere (Moderate)	Severe
Acute Illness or Injury	N/A	Measurably reduced
Chronic Illness	N/A	Measurably reduced
Social or Environmental Circumstances	N/A	Measurably reduced



# Circumstances that may interfere with a reliable NFPE



## Obesity

- Excess adipose tissue limits observation and palpation of underlying muscle mass.
- Assess for changes over time~upper body may show changes quicker than lower body

## Critical illness

- Limited patient participation
- Medical/hemodynamic instability
- Presence of edema
- Presence of lines/tubes/medical devices
- Assess these patients early and frequently

## Sarcopenia

- Long associated with muscle loss in aging process
- In addition to muscle loss is associated with decreased functional status
- Inflammation associated with sarcopenia and its potential effects on muscle and function need to be considered during the NFPE

# Challenges



# If no HGS, then WHAT??



Variety of other options...

- ☞ Timed gait and chair stands, stair climb test
- ☞ AM-PAC: Activity Measure for Post-Acute Care
- ☞ Lawton Instrumental Activities of Daily Living
- ☞ Katz Index
- ☞ Karnofsky Performance Scale Index
- ☞ MMT: Manual Muscle Testing
- ☞ SGA/PG-SGA functional status assessment

# Muscle Mass

Reference Methods Mass Measurements	Advantages	Disadvantages
Multiple Dilution	Safe and easy Important for multicompartment model calculations (use body volume, TBW, bone mass)	Assumptions regarding tracer and effect Assumption on hydration of FFM \$\$
DXA	Availability Precision Low radiation Regional and whole body measurements	Modest \$ Size limitations Nonspecific to skeletal mass and quality Measurements influenced by thickness & lean tissue hydration
CT	High resolution 3-D Regional & whole body quality measurements	Radiation exposure \$\$ Size limitations
MRI	High resolution 3-D Multiple measures of Skeletal muscle quality	Relatively high \$\$ Specialized skills Size limitations



# Muscle Mass

Mass Measurements	Advantages	Disadvantages
Anthropometry	Noninvasive Inexpensive	Training required Poor precision in certain populations (elderly, obese)
Bioimpedance	Variable cost Safe and portable Good for long term monitoring	Potential interferences to results (hydration, activity)
US	Noninvasive Safe Widely available	Training and technical skills required Techniques can influence measurements ID of reproducible sites critical Watch hydration, exercise

# Muscle Strength and Performance

## Strength

Hand Grip Strength - jamar validated , training  
Chair Stand Test

## Muscle Quantity

not validated and no consensus on criterion for classification

MRI, CT "gold standards" non-invasive measurement

Mid-thigh - better correlation to total body muscle volume

L3

DXA

BIA

US (also measure quality) - need more research

Anthropometry - not as reflective

## Performance

Gait Speed

Short Physical Performance Battery

Timed Up and Go Test

# Sarcopenia



☞ Recognized as a muscle disease with loss of lean muscle mass as well as decreased **muscle strength**

☞ ICD-10-MC code for billing in some countries

☞ Definition EWGSOP 2010:

☞ “Sarcopenia is a syndrome characterised by progressive and generalized loss of skeletal muscle mass and strength with a risk of adverse outcomes such as physical disability, poor quality of life and death “ [17, 18].

# Sarcopenia



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## Revised Definition proposal EWGSOP2 2019

- ❧ Probable sarcopenia is identified by Criterion 1.
- ❧ Diagnosis is confirmed by additional documentation of Criterion 2.
- ❧ If Criteria 1, 2 and 3 are all met, sarcopenia is considered severe.
  - ❧ (1) Low muscle strength
  - ❧ (2) Low muscle quantity or quality  
Hard to measure accurately
  - ❧ (3) Low physical performance



# Sarcopenia



- ❧ Now recognized at earlier ages
  - ❧ Primary sarcopenia related to aging
  - ❧ Secondary sarcopenia related to:
    - ❧ Disuse
    - ❧ Inflammation
    - ❧ Malnutrition
- ❧ Associated with malnutrition regardless of where it originates
  - ❧ decreased nutrient intakes
  - ❧ decreased nutrient bioavailability
  - ❧ increased nutrient requirements

# Sarcopenia and health



- ❧ Increases risk fall and fractures and leads to mobility issues
- ❧ Impairs ADLs
- ❧ Associated with cardiac disease, respiratory disease and mentation
- ❧ Lowers QOL and risk of losing independence
- ❧ Increase risk for more frequent hospitalization and increase in hospital costs and LOS
- ❧ Death
  
- ❧ Chronic  $\geq$  6 months

# Sarcopenia



## ❧ Sarcopenic Obesity

- ❧ Difficult to assess wasting
  - ❧ Requires direct measurement (BIA, ab CT,DXA)
- ❧ Increased risk for unidentified malnutrition
- ❧ Lack of weight change notable
- ❧ Decreased strength / function
- ❧ Increased mortality

<https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-hp-pdq>

<http://pen.sagepub.com/content/early/2014/04/03/0148607114529597>

Core CURric

# Covid-19



- ❧ New challenges for NFPE
  - ❧ Unable to physically assess patient
  - ❧ More reliant on medical chart
  - ❧ More discussions with Nursing/PCNA/Family
  - ❧ Telemedicine
  
- ❧ Feeding challenges
  - ❧ Prone positions



# Covid-19



Use of two validated clinical tools

- Malnutrition Universal Screening Tool (MUST)
- Strength, Assistance with walking, Rise from a chair, Climb stairs and Falls (SARC-F)

A simple remote nutritional screening tool and practical guidance for nutritional care in primary practice during the COVID-19

pandemic  
Clinical Nutrition 39 (2020) 1983e1987

# R-MAPP: REMOTE CONSULTATION ON MALNUTRITION IN THE PRIMARY PRACTICE

## A SIMPLE GUIDE TO ASSESSING PATIENTS BY VIDEO OR VOICE CALL

This graphic is intended for use in a primary care setting in order to identify patients at risk of malnutrition and ensure optimal nutritional care.

### SET UP

Prepare yourself for remote consultation

Check medical documentation for malnutrition risk factors and polymorbidity:

COVID - 19    Ageing / frailty    Cancer    COPD    IBD    Stroke    Post-ICU  
Chronic kidney and liver disease    Chronic wounds    Diabetes    Obesity    Other chronic diseases

### CONNECT

Contact patient by phone or video call

#### Check audio and video

Can you hear/see me?

#### Confirm the patient's identity

Name  
Surname  
Date of birth

#### Check patient's location

Where are you right now?  
Home  
Care Home  
Hospital

### EXAMINATION

Malnutrition screening

Use 'MUST' and 'SARC-F' to identify risk of malnutrition and muscle mass loss

'Malnutrition Universal Screening Tool' or 'MUST' is a five-step screening tool to identify adults, who are malnourished, at risk of malnutrition, or obese.

'SARC-F' is a rapid diagnostic test for sarcopenia based on 5 components.

#### IDENTIFY MALNUTRITION RISK

Check if your patient is at risk of malnutrition by asking the following 3 questions:

'MUST' Malnutrition screening tool		
What is your current body weight?	0	> 20 (> 30 Obese)
What is your height?	1	18.5-20
Calculate patients BMI kg/m <sup>2</sup> *	2	< 18.5
What is your usual weight?	0	Weight loss < 5 %
Have you experienced unintentional weight loss in the last 3 - 6 months?	1	Weight loss 5-10 %
	2	Weight loss > 10 %
Are you acutely ill or has your food intake been reduced / likely to be reduced for > 5 days?	0	No
	2	Yes

\*Body Mass Index (or BMI) is calculated as weight (in kg) divided by the square of height (in m)

Add 'MUST' scores together to calculate overall risk of malnutrition:

Score 0 Low Risk  
Score 1 Medium Risk  
Score 2 or more High Risk

#### IDENTIFY LOSS OF MUSCLE MASS AND FUNCTION

If the 'MUST' score is  $\geq 1$  or your patient has one or more malnutrition risk factors (see in "Set up" box) check for sarcopenia.

'SARC-F' Sarcopenia screening Test		
<b>STRENGTH</b> How much difficulty do you have in lifting and carrying 4.5 kg? <i>*4.5 kg is approximately the weight of a pet cat or pumpkin</i>	0	None
	1	Some
	2	A lot or unable
<b>ASSISTANCE WITH WALKING</b> How much difficulty do you have walking across a room?	0	None
	1	Some
	2	A lot, use aids, or unable
<b>RISE FROM A CHAIR</b> How much difficulty do you have transferring from a chair or bed?	0	None
	1	Some
	2	A lot or unable without help
<b>CLIMB STAIRS</b> How much difficulty do you have climbing a flight of 10 stairs?	0	None
	1	Some
	2	A lot or unable
<b>FALLS</b> How many times have you fallen in the past year?	0	None
	1	1-3 falls
	2	4 or more falls

'SARC-F' score equal to or greater than 4 is predictive of sarcopenia

### DECISION AND ACTION

Advise, intervene and arrange follow-up according to nutritional screening results

'MUST' Score  $\leq 1$  or/and  
'SARC-F' Score  $< 4$

#### OBSERVE AND REPEAT SCREENING

in Care Homes monthly and in community annually for at-risk groups e.g. those > 75 yrs

'MUST' Score  $\geq 2$  or/and  
'SARC-F' Score  $\geq 4$

#### TREAT

Recommend oral nutritional supplements (ONS) or continue nutrition support; physical activity should also be encouraged as possible

If the patient is already on ONS check compliance  
2 bottles is usual recommended daily dose

If you need help refer to clinical dietitian, hospital physician or implement local policy.

### INTERVENTION

Tailor nutritional therapy to your patient's needs

**ENERGY**  
25 - 35 kcal/kg  
body weight/day\*

**PROTEIN**  
> 1.0 g/kg  
body weight/day\*\*

**MICRONUTRIENTS**  
daily requirements\*\*\*

#### THERAPEUTIC NUTRITION

- Consider HMB / leucine, vitamin D for patients with muscle mass and/or function loss
- Omega-3 EPA for cancer patients
- Arginine, Glutamine, Zinc, HMB, vitamin C for chronic wounds
- TGF- $\beta$ 2 for IBD patients

**SPECIAL CONSIDERATIONS:** Kidney disease: formulas with modified protein and electrolytes / Diabetes: formulas with slow-release & low glyceric index carbohydrates / Dysphagia: modified texture diets and thickened drinks / Malabsorption: peptide-based formulas with medium chain triglycerides

HMB -  $\beta$ -hydroxy- $\beta$ -methylbutyrate | EPA - eicosapentaenoic acid  
\* In obese and sarcopenic obese patients should be calculated with ideal body weight  
\*\* The level of protein to be used, eg. in patients with severe kidney disease (e. GFR $\leq$ 30 mL/min/1.73m<sup>2</sup>), use 0.6 g of protein/kg BW/day  
\*\*\* Should be adjusted individually in case of deficiencies

# Micronutrients





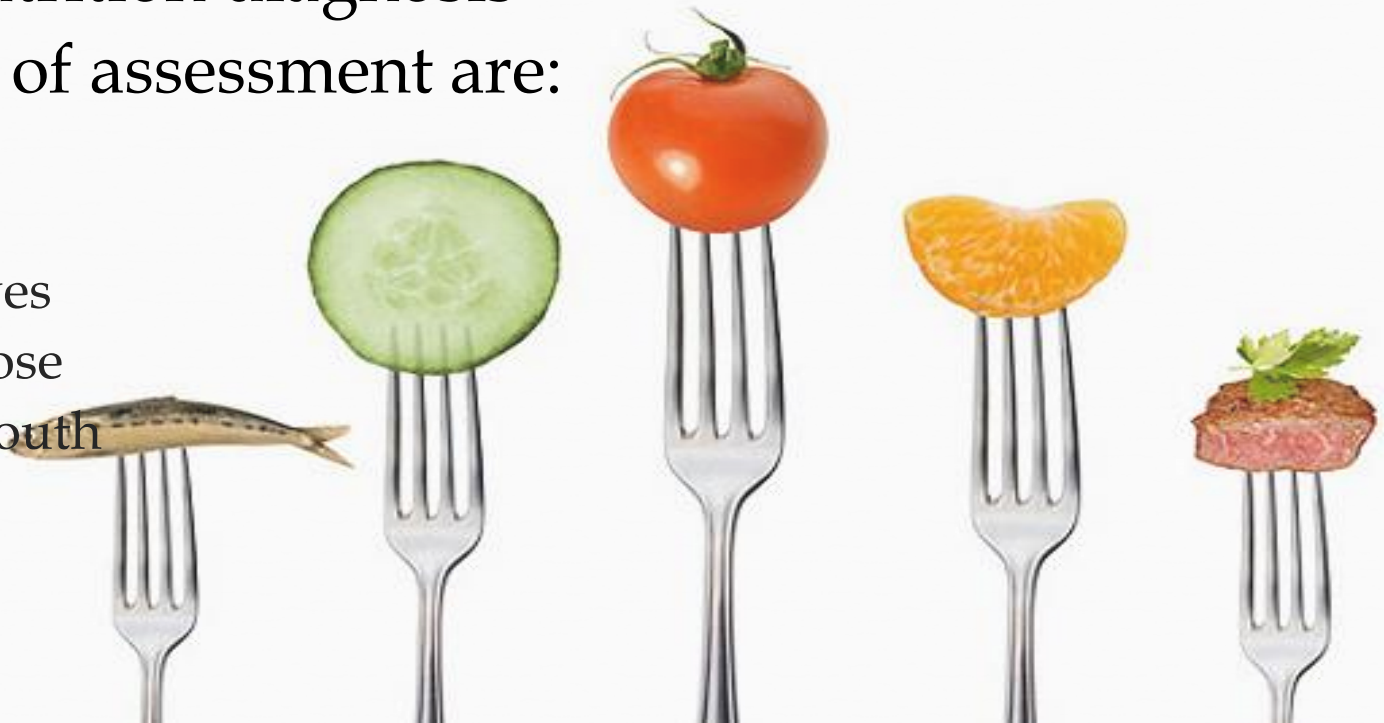
# Micronutrient Deficiencies



❧ Micronutrient deficiencies-supporting evidence for malnutrition diagnosis

❧ Areas of assessment are:

- Hair
- Face
- Eyes
- Nose
- Mouth
- Neck
- Skin
- Nails





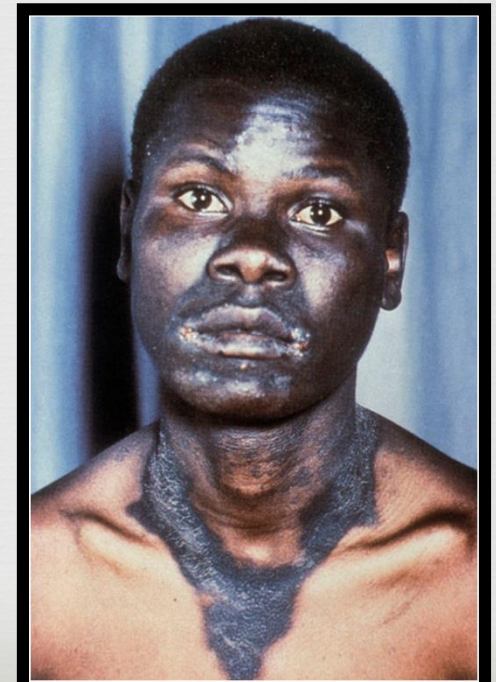
# Micronutrients



- ∞ Head to toe assessment
  - ∞ Not part of characteristics
  
- ∞ Are the findings substantiated:  
laboratory data, medical and diet history
  
- ∞ Confirm findings:
  - laboratory data
  - consult (i.e.: dermatology)
  - Prophylactic treatment as medically appropriate

# SKIN:

Physical Findings	Possible Nutrient Deficiency	Non Nutritional Cause
<b>Flaky paint dermatosis:</b> hyper-pigmented patches	Protein	
<b>Petechiae:</b> Hemorrhagic spots on skin or mucous membranes	Vitamin C or K	hematological disorders (chemo) liver disease anticoagulation overdose Cushing's disease
<b>Pellagrous Dermatitis:</b> Hyperpigmentation of skin exposed to sunlight	Niacin or tryptophan	thermal/chemical/sun burns Addison's disease



Physical Findings	Possible Nutrient Deficiency	Non Nutritional Cause
<b>Pallor</b> ; paleness	Iron (anemia)	Low volume or low perfusion states
<b>Poor or delayed wound healing</b>	Protein, zinc, Vitamin A & C	PVD, arterial insufficiency
<b>Xerosis</b> : abnormal dryness	Vitamin A, EFA	Hygiene, aging, hypothyroidism, uremia, ichthyosis
<b>Follicular hyperkeratosis</b> : plaques around hair follicle	Vitamin A & C, EFA	Infection of hair follicle, Darier disease, syphilis
<b>Perifolliculosis</b> : pigmented plaques (usually upper legs, thorax, abdomen)	Vitamin C	Diabetic dermopathy (usually lower legs, feet)
<b>Dermatitis</b> , generalized	Zinc, EFA	Atopic dermatitis, allergy or medication rash, psoriasis





# Hair

- ☞ Shiny, smooth, not easily plucked
  - Assess: color, distribution, texture, loss



- ☞ Poor hair quality may indicate a nutrition deficiency:
  - Protein, zinc, essential FA, biotin deficiency



- ☞ Lanugo (fine hairs) which become more fragile as energy deficiency prevails





# FACE:

Physical Findings	Possible Nutrient Deficiency	Non Nutritional Cause
<b>Eyes: Bitot spots</b>	Vitamin A	Connective tissue disorders, autoimmune disease, vascular abnormalities
<b>Eyes: Loss of night vision</b>	Vitamin A	
<b>Nose: Nasolabial seborrhea</b> scaling around nostrils	Vitamin B-2, B-6, zinc or niacin	Reaction to medications



Normal Vision

Night Blindness




# Lips/Gums:

Physical Findings	Possible Nutrient Deficiency	Non Nutritional Cause
<b>Lips: Bilateral fissures (angular stomatitis)</b>	Vitamin B-2, B-6 Niacin, Iron	poor fitting dentures herpes syphilis bulimia
<b>Lips: Cheilosis (dry swollen cracked lips)</b>	Vitamin B-2, B-6 Niacin, Iron	environmental herpes
<b>Gums: spongy, bloody</b>	Vitamin C	Periodontal disease



# Tongue

Physical Findings	Possible Nutrient Deficiency	Non Nutritional Cause
Glossitis: inflammation of tongue, magenta color	Vitamins B-2, B-6, B-12, niacin, folate, iron (severe)	Crohn' s, uremia, infection, malignancy, anticancer therapy, trauma
Edematous tongue	Niacin	Acromegaly, amyloidosis



☞ Examine Tongue using tongue depressor

☞ Note any mouth sores which may impair ability to eat

# Nails:

Physical Findings	Possible Nutrient Deficiency	Non Nutritional Cause
Poor blanching	Vitamin A or C	ischemia
Koilonychia: spoon shaped nails with thins raised edges	Iron or protein	hereditary infection endocrine hematologic issues trauma
Transverse ridging: White banding and Beau's lines	zinc or protein	trauma coronary occlusion hypercalcemia chemotherapy





Physical Findings	Possible Nutrient Deficiency	Non Nutritional Cause
<b>Lackluster</b> , dull	Protein	Infection (Candida albicans), congenital, Lupus
<b>Splinter hemorrhages:</b> distal end of nails, multiple	Vitamins A & C	Septicemia, trauma, skin disorders, hemodialysis, hemochromatosis, vascular disease
<b>Flaky nails</b>	Magnesium, Selenium	



# Importance of Diagnosing and Documentation



# Payment Structure with Medicare

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- ❧ DRG: Diagnostic Related Group
  - ❧ Each has a number, narrative, mean LOS, relative weight (indicates the amount of resources needed; higher number = more resources)
- ❧ DRGs have tiers:
  - ❧ Based on the presence of **secondary diagnoses** that impact care, treatment, evaluation, LOS of the patient
- ❧ Secondary diagnoses:
  - ❧ **MCC = Major Complication/Comorbidity**
    - ❧ Highest severity level - **severe malnutrition**
  - ❧ **CC = Complication/Comorbidity**
    - ❧ Not as severe as MCC - **moderate malnutrition, mild malnutrition**
  - ❧ Non-CC = Non-Complication/Comorbidity, **no malnutrition**

# Should I be concerned if I change the etiology and the severity of malnutrition changes?



- ❧ Primary team MD needs to document malnutrition in at least 1 note
- ❧ RD notes are used as supportive documentation
- ❧ Coders use the most severe level of malnutrition
- ❧ Coders are using the ASPEN/ Academy criteria
- ❧ Documentation discrepancies are sent to Clinical Documentation Improvement (CDI) for resolution



# Improved Nutrition Documentation

Crohns Disease	Crohns Disease	Crohns Disease
<b>\$11,269</b>	<b>\$17,496</b>	<b>\$34,811</b>
<b>MS-DRG 331</b> <i>without CC or MCC</i>	<b>MS-DRG 330</b> <i>with CC</i>	<b>MS-DRG 329</b> <i>with MCC</i>
276.8 Tachycardia 785.0 Hypokalemia Weight Loss 783.21	112.0 Oral Thrush 263.9 Malnutrition	262 Severe Protein Cal Malnutrition
<b>45.72 Small bowel resection with end to end anasto</b>	<b>45.72 Small bowel resection with end to end anasto</b>	<b>45.72 Small bowel resection with end to end anasto</b>
<b>RW 1.6380</b> <b>GMLOS 4.4</b> <b>SOI 1</b> <b>ROM 1</b>	<b>RW 2.5609</b> <b>GMLOS 7.3</b> <b>SOI 2</b> <b>ROM 1</b>	<b>RW 5.1272</b> <b>GMLOS 11.9</b> <b>SOI 3</b> <b>ROM 2</b>

# PDPM



- ❧ Reimbursement dollars based on service
  - ❧ Dietitians fall into the NTA category
    - ❧ Non-therapy ancillary
- ❧ Comorbidities contribute to more dollars
  - ❧ Malnutrition is considered a comorbidity that can be billed
- ❧ Requires malnutrition diagnosis in the MDs note
  - ❧ ICD-10 code
- ❧ Coders look to the Dietitian's note for accuracy

# Malnutrition Project - Benefits



- ∞ Increased Reimbursement
- ∞ Accurate Documentation
- ∞ Proper assessment of acuity of patients for Quality Metrics

# NFPE Video



Putting it all together





**ANYONE CAN BE COOL**



**BUT AWESOME TAKES PRACTICE**

# Case Studies



# Case Study: Patient #1



65 year old female with liver failure that has been worsening these past few months. Patient reports she's been hospitalized several times recently with multiple issues related to her liver disease.

PMHx: Cirrhosis, 4 yrs ago

Labs: WBC: 6.1    Alb 2.7    Glu: 99    Pre-Alb: 13.2

Ht: 5'8" (172.7 cm) Current Wt: 130 lbs (59 kg)



# Case Study: Patient #1

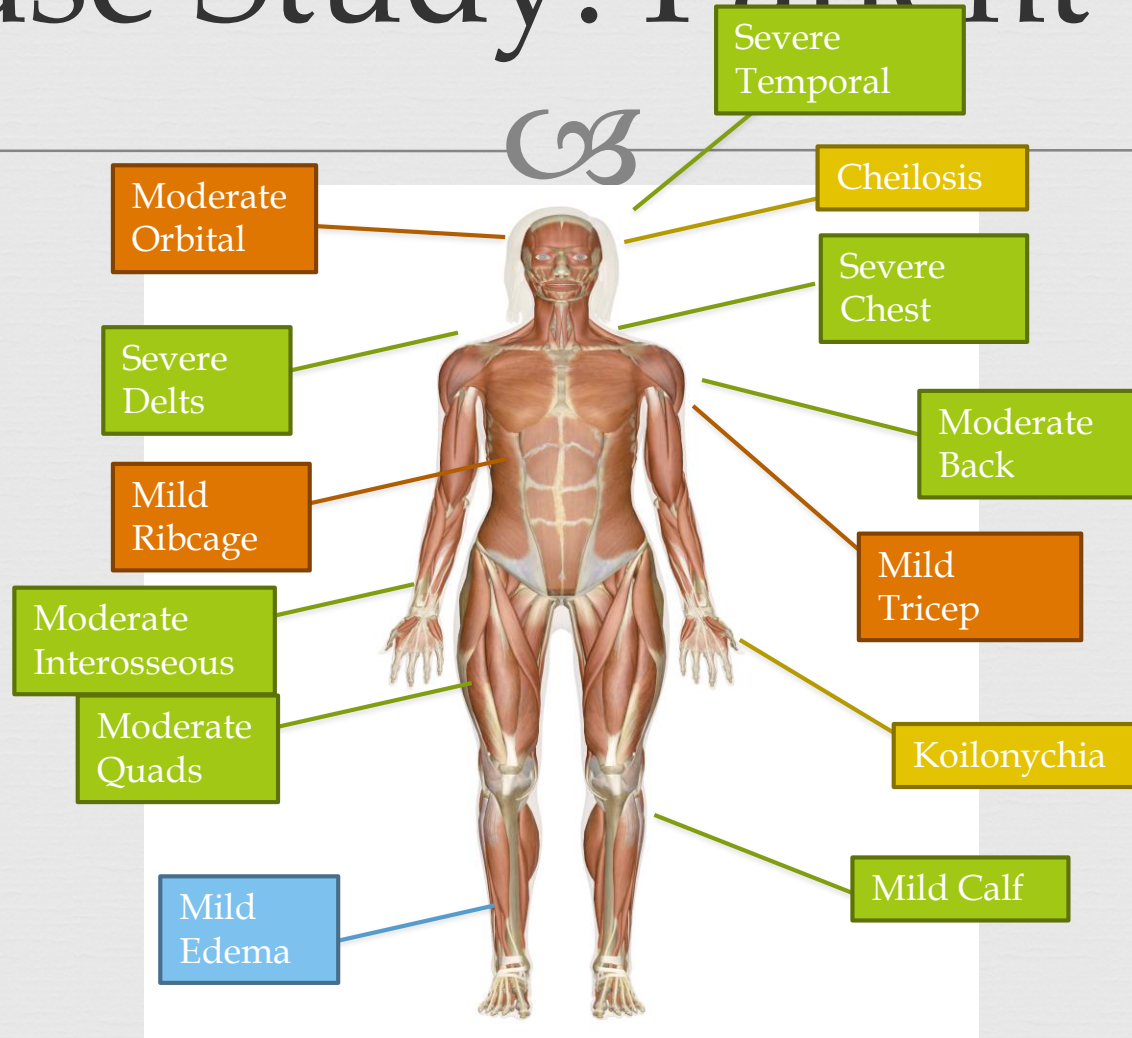


During the interview you uncover:

- ☞ Eating about 50-75% of her needs over the last 2-3 months
- ☞ She is unable to do some activities of daily living due to fatigue that started about 2 month ago
- ☞ Her dry UBW is 150 lbs (68kg) – last weighed this 5-6 months ago

Time for the NFPE!

# Case Study: Patient #1



# Case Study: Patient #1



<b>CHRONIC Illness</b>	Moderate	Severe
<b>Insufficient energy intake</b> (i.e. recent food intake compared to requirements)	≤75% for ≥1 month	<75% for ≥1 month
<b>Unintentional weight loss</b> (i.e. percent weight loss over time compared to usual body wt)	5% in 1 month 7.5% in 3 months 10% in 6 months 20% in 1 year	>5% in 1 month >7.5% in 3 months >10% in 6 months >20% in 1 year
<b>Loss of subcutaneous fat (orbital, triceps, ribcage)</b>	Mild loss	Severe loss
<b>Loss of muscle mass</b> (temples, chest, shoulder, back, thighs, calves)	Mild loss	Severe loss
<b>Fluid accumulation generalized/localized</b> (feet, legs, arms, back, vulva scrotum)	Mild	Severe
<b>Diminished functional capacity</b>	No change	Decline in physiological function

# Case Study: Patient #2



79 year old male with history of well managed DMT2, BKA, uses a wheel chair to move around. He has lived in the assisted living area for 3 years. Moved in to be closer to his wife in the acute care center, she recently died about 1 month ago.

Labs:      WBC 5.4                      Alb 3.8                      Glu 109

Vitals:      all WNL

Height: 5'10" (177.8 cm)

Today's weight: 147 lbs (66.8 kg)



# Case Study: Patient #2

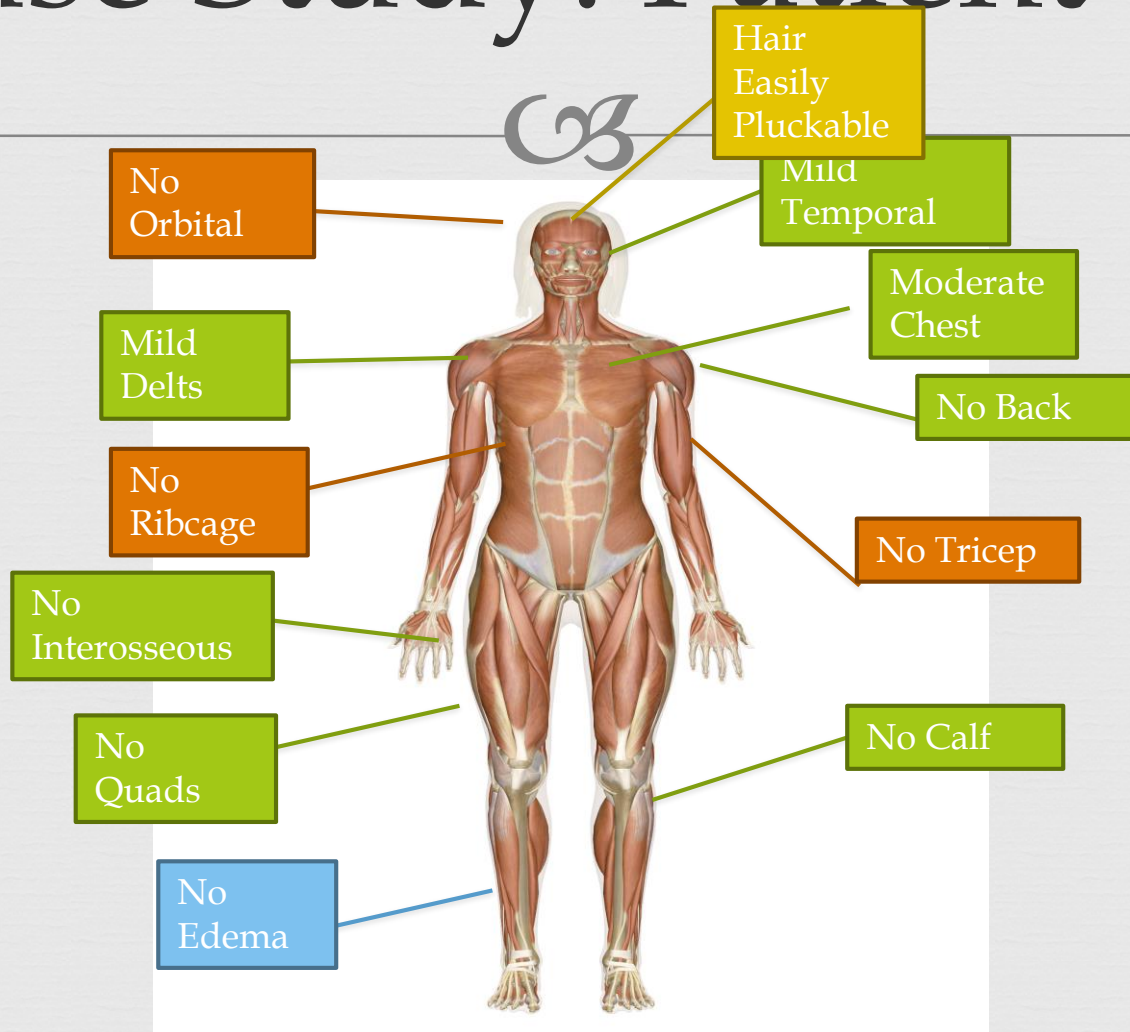


During the interview you uncover:

- ☞ Eating about 25-50% of his needs over the last 1 month
- ☞ He feels depressed since losing his wife and doesn't feel up to much activity including making and eating meals
- ☞ His UBW is 155 lbs (70.4 kg) – last weighed this 1 month ago

Time for the NFPE!

# Case Study: Patient #2



# Case study: Patient #2



<b>Social/Environmental</b>	<b>Moderate</b>	<b>Severe</b>
<b>Insufficient energy intake</b> (i.e. recent food intake compared to requirements)	<b>&lt;75% for ≥3 months</b>	<b>≤50% for ≥1 month</b>
<b>Unintentional weight loss</b> (i.e. percent weight loss over time compared to usual body wt)	<b>5% in 1 month</b> <b>7.5% in 3 months</b> <b>10% in 6 months</b> <b>20% in 1 year</b>	<b>&gt;5% in 1 month</b> <b>&gt;7.5% in 3 months</b> <b>&gt;10% in 6 months</b> <b>&gt;20% in 1 year</b>
<b>Loss of subcutaneous fat</b> (orbital, triceps, ribcage)	<b>Mild loss</b>	<b>Severe loss</b>
<b>Loss of muscle mass</b> temples, chest, shoulder, back, thighs, calves	<b>Mild loss</b>	<b>Severe loss</b>
<b>Fluid accumulation</b> Generalized/localized fluid collection (feet, legs, arms, back, vulva/scrotum)	<b>Mild</b>	<b>Severe</b>
<b>Diminished functional capacity</b>	<b>Decline in physiological function</b>	<b>Decline in physiological function</b>

# Questions



Thank you!