NUTRITIONAL NEEDS IN OLDER ADULTS 3.0

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DISCLOSURES:

- I do not have a financial interest or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.

PRE-TEST: QUESTION 1

- **All of the following signs are potential risks for malnutrition in adults 50 years and older; however, which of the following signs are the MOST WORRISOME indicators of nutritional risk for malnutrition?**

A. Change in appetite and unintentional weight loss
B. Low and fixed level of income
C. Changes in sense of taste and smell
D. Isolation and changes in mobility

PRE-TEST: QUESTION 2

- **In adults 50 years and older, what is an appropriate amount of daily calcium and vitamin D intake?**

A. 800 mg Calcium + 400 IU's Vitamin D
B. 1000 mg Calcium + 400 IU's Vitamin D
C. 1000 mg Calcium + 800 IU's Vitamin D
D. 1200 mg Calcium + 1000 IU's Vitamin D

PRE-TEST: QUESTION 3

- **In otherwise healthy adults 50 years and older with no major medical conditions, what is an appropriate starting amount of protein per day?**

A. 0.8 mg Protein/kg/day
B. 1.0-1.2 mg Protein/kg/day
C. 1.2-1.4 mg Protein/kg/day
D. 1.4-1.6 mg Protein/kg/day

OBJECTIVES:

1. Perform a **nutritional needs assessment** for older adults
2. Identify **nutritional risk factors** and recognize the clinical features of **four common undernutrition syndromes** in older adults.
3. Diagnose malnutrition in older adults
4. Calculate **nutritional needs** in older adults
5. Describe appropriate nutritional recommendations as well as **treatments for macronutrient and micronutrient deficiencies** in older adults.

WHY IS THIS IMPORTANT TO PA'S?

- Malnutrition in older adults is common
- Malnutrition has increased morbidity, mortality, & healthcare costs
- Malnutrition syndromes are being encountered with increased frequency in PA clinical practice across a wide range of medical specialties.

CASE STUDY: MEET DIANE

- **56 y/o post-menopausal female with history of diabetes (type 2), hypertension, obesity, and depression presents for routine follow up visit.**
  - **Family History**: Heart Disease, Diabetes, Osteoporosis, Cancer
  - **Social**:
    - Lives alone (divorced); both children live out of state.
    - Works at call center with fixed income.
    - No alcohol use; 15 pack year history of smoking (quit > 10 years ago)
  - **Medications**: Metformin 1g BID, Lisinopril 20mg QD, Atorvastatin 40mg QD, Prozac 20mg
  - **Vitals**: BMI 39.4, Wt: 230 lbs (104.5 kg) Ht: 5'4" (162.5 cm), BP: 128/82
    - You note an ~25 lb weight loss, unintentional, although she is thrilled about it.
  - **Exam**: Poor oral health with multiple dental caries; missing upper molars.
  - **Labs**: A1C 6.8%, SCr: 1.3, LFT's WNL

CASE STUDY: THINGS TO CONSIDER

- What are Diane's nutritional risk factors?
- Can we identify at least one malnutrition syndrome for Diane?
- Does Diane meet the diagnostic criteria for malnutrition?
- What are Diane's daily calorie needs?
- How many grams of protein does Diane need daily?
- How much calcium/vitamin D does Diane require daily?

DEFINING OUR POPULATION:

- What is aging? "Time related decline of physiological functions, leading to changes in functional performance of different organ systems."
- What defines and influences the term "older adult?"
- There is not consensus on what age defines "the older adult"
  - 60+ = WHO, NCOA
  - 65+ = CDC, HHS

- Nutritionally, 50 years old is a threshold or milestone

THE AGING DILEMMA:

- **Age**: a risk factor for the development of chronic disease.
  - Older persons are particularly susceptible to disease-related weight loss, loss of muscle mass/strength (sarcopenia) and ultimately the "frailty syndrome,"
  - Weight Loss: a marker of macronutrient deficiency and/or catabolism, is a common key initial phenomenon in older patients, which sets off a cascade of unfavorable events resulting in higher morbidity and mortality.
- **What causes weight loss in higher age?** It's multifactorial
  - Disease processes (catabolic events)
  - Disease or age-related anorexia ("anorexia of aging")
  - Subsequent insufficient dietary intake, but also depressive or cognitive disorders and decreased socio-economic status.

PREVALENCE AND IMPACT:

- **U.S. Census Data: 2020**
  - ~117.4 million Americans 50 and older
  - ~35% of Americans are 50 years and older
  - ~16.8% of Americans are 65 years and older

- **National Council on Aging:**
  - People are living longer. In 2019, there were 6.6 million Americans over the age of 85.
  - Chronic Disease: ~80% of older adults have at least 1 chronic medical condition and two-thirds have 2+ chronic conditions.
  - Falls: Falls cost Medicare $31 billion each year
  - Hunger: More than 10 million older Americans lack financial means to consistently purchase sufficient food (~10% of individuals aged 50+)

PREVALENCE AND IMPACT:

- **Older adults with malnutrition have:**
  - Higher morbidity and mortality rates
  - Higher infection rates
  - Reduced wound healing
  - Longer and more expensive hospitalizations
  - Higher readmission rates
  - Increased healthcare costs

- **Older adults with malnutrition are associated with:**
  - Development of "geriatric syndromes"
    - frailty, falls, functional decline, pressure ulcers
    - cognitive impairment, delirium, depression
  - Loss of Independence
  - Decreased effectiveness of medical treatments
  - Medical complications

MALNUTRITION IS A COMMON AND COSTLY PROBLEM FOR EVERYONE: TOTAL ANNUAL BURDEN

$157 Billion

disease-associated malnutrition cost to **our society and healthcare systems**

$51 Billion

disease-associated malnutrition cost for the **"older population"**

Source: Snider JT, et al. JPEN J Parenter Enteral Nutr. 2014;38(2 Suppl):77S-85S.

GERIATRIC SYNDROMES

A term that often refers to a health condition in older adults that do not fit into distinct organ-based disease categories and often have multifactorial causes.

- Frailty, Fatigue, Falls, Dizziness, Gait Disorders
- Cognitive Impairment, Delirium
- Incontinence, Pressure Ulcers

- Common in older adults with major impact on quality of life.

- Multifactorial – not caused by malnutrition alone, but they are more prevalent and worse with malnutrition!

RISK FACTORS IMPACTING NUTRITIONAL NEEDS:

- **Chronic Medical Conditions:**
  - CAD, Stroke, Diabetes, Hypertension, Hyperlipidemia, Obesity, Cancer
  - Oral Health Concerns, Changes in Taste/Smell
  - Chronic Kidney Disease, electrolyte imbalances (Na+/K+)
  - Gastrointestinal Disorders, Constipation, Chronic Liver Disease
  - Wounds: Pressure Ulcers, Diabetic Ulcers
  - Osteoporosis/Osteopenia, Arthritis
  - Post Surgical Healing
  - Polypharmacy: Drug-Nutrient Interactions, EtOH consumption
- **Mental Health:**
  - Dementia, Alzheimer's etc.
  - Depression, Anxiety, Neglect etc.

ELDERLY: DENTITION IMPACTS NUTRITION

- Tooth Loss: 20% of elderly have zero teeth![1]
  - Missing teeth and dentures affect chewing
  - Softer, easy-to-chew foods work better
- Gum Disease: 68%[1]
- Untreated Tooth Decay: 96% have cavity history and 20% have untreated tooth decay[1]
- Dry mouth/reduced saliva flow: Rx and OTC play a role[1]
- Tooth loss in the elderly has been associated with both weight loss[2] and obesity[3]

1. https://www.cdc.gov/oralhealth/basics/adult-oral-health/adult_older.htm.
2. Ritchie CS et al. *J Gerontol A Biol Sci Med Sci*. 2000;55(7): M366-M371.
3. Sheiham A et al. *Br Dent J*. 2002;192(12):703-706.

RISK FACTORS IMPACTING NUTRITIONAL NEEDS:

- **Diverse Patient Settings:**
  - Inpatient
  - Outpatient
  - Skilled Nursing Facilities (SNF)
  - Rehab Facilities
  - Community Dwelling Facilities
  - Assisted Living Homes
  - Rural vs Urban
- **Socioeconomic Status:**
  - Retired (vs) Work-Force

RISK FACTORS IMPACTING NUTRITIONAL NEEDS:

- **Most important risk factors for malnutrition:**
  1. Changes in appetite (decreased appetite)
  2. Unintentional weight-loss

- **Weight loss is considered to be clinically significant if:**
  - >2% decrease from baseline in 1 month
  - > 5% decrease from baseline in 3 months
  - >10% decrease from baseline in 6 months.

NUTRITION 101: WHAT ARE MACRONUTRIENTS AND MICRONUTRIENTS?

- **Macronutrients:**
  - **Carbohydrates** = 4 kcal/gram
  - **Proteins** = 4 kcal/gram
  - **Fats** = 9 kcal/gram
  - **Alcohol** = 7 kcal/gram
  - **Water** = 0 kcal/gram
- **Micronutrients:**
  - **Vitamins** (thiamine, cobalamin, folate etc)
  - **Minerals** (calcium, iron, zinc etc)
  - **Phytochemicals** (polyphenols, terpenoids, flavonoids etc)

NUTRITION 101: WHAT IS MALNUTRITION?

- **Defining Malnutrition:** Malnutrition = "Nutritional imbalance"
  - **Undernutrition** (vs) **Overnutrition** = Malnutrition!
  - Malnutrition is a spectrum disorder!
- **Clinical Mindset - Overnutrition (vs) Undernutrition Syndromes:**
  - **Overnutrition**: Obesity, diabetes, hypertension, heart disease, GERD, gout
  - **Undernutrition**: Protein malnutrition, Iron deficiency, vitamin deficiencies, sarcopenia, osteoporosis, cancer, wounds
  - **Both ends of the spectrum**: Obesity, eating disorders, alcoholism, GERD (effects of chronic acid suppression), S/P bariatric surgery, polypharmacy, low SES (food access)

NUTRITION 101: WHAT IS MALNUTRITION?

The Spectrum:

MACRONUTRIENT MALNUTRITION SYNDROMES:

- **Undernutrition Malnutrition**:
  - Inadequate Dietary Intake: Calories, Protein, or Both!
- **Protein Malnutrition**: (Kwashiorkor) – Enough calories, not enough protein
- **Calorie Malnutrition**: (Marasmus) – Not enough calories AND protein
- **Anorexia**: an abnormal loss of appetite for food. Anorexia can be caused by cancer, AIDS, a mental health disorder (anorexia nervosa, depression etc) or other diseases
- **Cachezia**: a condition marked by loss of appetite, subsequent weight loss, lean body mass/muscle loss, and general weakness
- **Sarcopenia**: an age dependent loss of muscle mass and function
- **Obesity**: BMI > 30.0
- **Sacropenic Obesity**: the presence of both sarcopenia and obesity

MICRONUTRIENT DEFICIENCIES:

NHANES data indicates adults older than 50 years are at risk for inadequate intake of the following:

- Calcium & Vitamin D
- Iron
- Vitamin B12
- Vitamin B6
- Vitamin E
- Magnesium

INCORPORATING NUTRITIONAL SCREENING INTO ROUTINE PATIENT CARE

General Approach:

EMR

- Individual Patient Visits (vs) Population-based Metrics
- Pre-visit Planning – Screening Questionnaires
- During Visit – growth charts, weight/lab trends

Screening Questionnaires

- The Challenge: So many tools to pick from and when/which to implement?
- MNA, SGA, NSAQ, NUTRIC
- Use of support staff (MA, RN to collect information and provider to review)

Anthropometrics/Vitals

- BP, Weight, Height, BMI, Waist Circumference
- Trends: Reported Weight (vs) Documented Weight

Physical Exam Findings

Labs: +/- depending on anthropometrics, history, questionnaires, and risk.

BP, blood pressure; BMI, body mass index; EMR, electronic medical records; MNA, Mini Nutritional Assessment; NSAQ, Short Nutritional Assessment Questionnaire; NUTRIC, Nutrition Risk in the Critically Ill; SGA, Subjective Global Assessment

SCREENING FOR NUTRITIONAL STATUS: **HISTORY**

- **History**:
  - Dietary recalls, food journals, and direct patient questioning can be time intensive, but yield more information.
  - Use of screening questionnaires can save time.

  - Evaluate Appetite and dietary Intake:
    - Question patient regarding appetite, dietary intake, number of meals/snacks, portion sizes, satiety, and if they actually like what they eat.
    - Change in Hunger or Satiety (vs) Formal Dietary Recall

  - Reported Weight-Loss (vs) Documented Weight-Loss
    - Weight trends can be more helpful than a single documented weight.

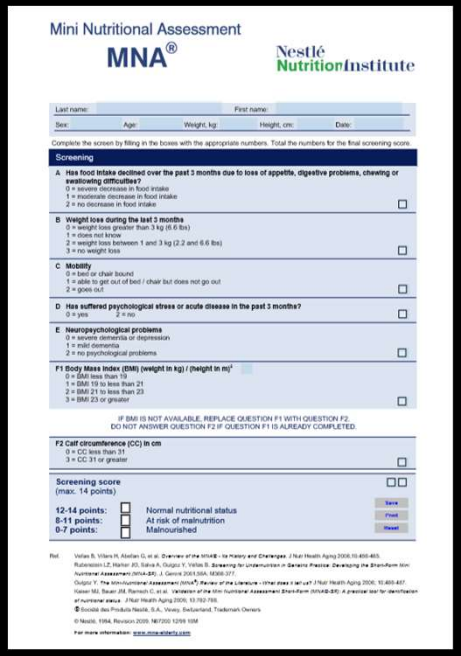
SCREENING FOR NUTRITIONAL STATUS: **HISTORY**

- **Findings on Patient History:**
  - **"Red Flags"**
    - Changes in body weight (both weight loss and weight gain)
      - Trends helpful!
      - Intentional vs **unintentional weight change**
    - Increase or **decrease in appetite** (anorexia)
    - Financial limitations (food access)
      - Access to healthy nutritious foods (vs) access to high-calorie, low-quality foods (i.e. fast foods)
    - Chronic Conditions: Can be responsible for both weight gain and loss
    - Swallowing/Chewing Issues: Dysphagia
    - Medications: can be responsible for both weight gain and loss
    - Changes to ADL's & IADL's

SCREENING FOR NUTRITIONAL STATUS: **QUESTIONNAIRES**

- **Subjective Global Assessment (SGA)**
  - Inexpensive, quick nutritional assessment method conducted at the bedside, reliable tool for predicting outcomes in critically ill patients
- **Simplified Nutrition Assessment (SNAQ)**
  - Four-item screener, was tested in community-dwelling older adults and long-term care residents. In those populations, it had a sensitivity and specificity of 81.3 and 76.4, and 88.2 and 83.5 percent, respectively, for identification of older persons at risk for 5 and 10 percent weight loss respectively.
- **Mini Nutrition Assessment (MNA)**
  - Consist of a global assessment and subjective perception of health, as well as questions specific to diet, and series of body measurements. It has been widely validated and is predictive of poor outcomes.

EXAMPLES OF NUTRITIONAL SCREENING TOOLS



Mini Nutritional Assessment

MNA®

Nestlé Nutrition Institute

Last name: First name:

Sex: Age: Weight, kg: Height, cm: Date:

Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.

Screening

A **Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?**
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake

B **Weight loss during the last 3 months**
0 = weight loss greater than 3 kg (6.6 lbs)
1 = does not know
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)
3 = no weight loss

C **Mobility**
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out

D **Has suffered psychological stress or acute disease in the past 3 months?**
0 = yes 2 = no

E **Neuropsychological problems**
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems

F1 **Body Mass Index (BMI) (weight in kg) / (height in m)²**
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2.
DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 **Calf circumference (CC) in cm**
0 = CC less than 31
3 = CC 31 or greater

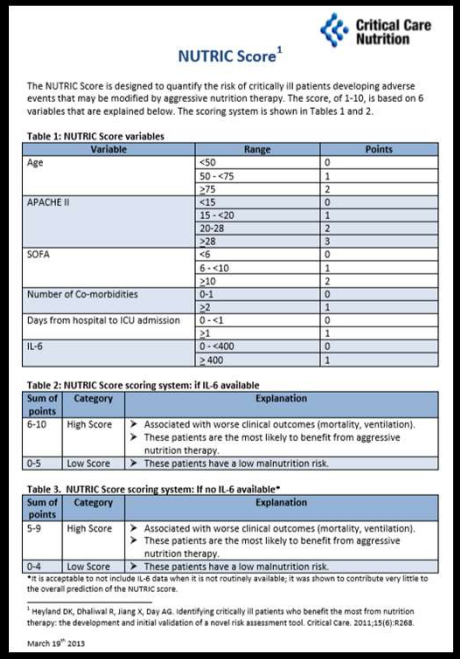
Screening score (max. 14 points)

12-14 points: Normal nutritional status
8-11 points: At risk of malnutrition
0-7 points: Malnourished

Save Print Reset

Ref. Vellas B, Villars H, Abellan G, et al. Overview of the MNA® - Its History and Challenges. J Nutr Health Aging 2006;10:456-465.
Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF). J. Geront 2001;56A: M366-377.
Guigoz Y. The Mini-Nutritional Assessment (MNA®) Review of the Literature - What does it tell us? J Nutr Health Aging 2006; 10:466-487.
Kaiser MJ, Bauer JM, Ramsch C, et al. Validation of the Mini Nutritional Assessment Short-Form (MNA®-SF): A practical tool for identification of nutritional status. J Nutr Health Aging 2009; 13:782-788.

For more information: www.mna-elderly.com



Critical Care Nutrition

NUTRIC Score[1]

The NUTRIC Score is designed to quantify the risk of critically ill patients developing adverse events that may be modified by aggressive nutrition therapy. The score, of 1-10, is based on 6 variables that are explained below. The scoring system is shown in Tables 1 and 2.

Table 1: NUTRIC Score variables

Variable	Range	Points
Age	<50	0
	50 - <75	1
	≥75	2
APACHE II	<15	0
	15 - <20	1
	20-28	2
	>28	3
SOFA	<6	0
	6 - <10	1
	≥10	2
Number of Co-morbidities	0-1	0
	≥2	1
Days from hospital to ICU admission	0 - <1	0
	≥1	1
IL-6	0 - <400	0
	≥ 400	1

Table 2: NUTRIC Score scoring system: if IL-6 available

Sum of points	Category	Explanation
6-10	High Score	➢ Associated with worse clinical outcomes (mortality, ventilation). ➢ These patients are the most likely to benefit from aggressive nutrition therapy.
0-5	Low Score	➢ These patients have a low malnutrition risk.

Table 3. NUTRIC Score scoring system: If no IL-6 available*

Sum of points	Category	Explanation
5-9	High Score	➢ Associated with worse clinical outcomes (mortality, ventilation). ➢ These patients are the most likely to benefit from aggressive nutrition therapy.
0-4	Low Score	➢ These patients have a low malnutrition risk.

*It is acceptable to not include IL-6 data when it is not routinely available; it was shown to contribute very little to the overall prediction of the NUTRIC score.

[1] Heyland DK, Dhaliwal R, Jiang X, Day AG. Identifying critically ill patients who benefit the most from nutrition therapy: the development and initial validation of a novel risk assessment tool. Critical Care. 2011;15(6):R268.

March 19th 2013

Subjective Global Assessment Form

MEDICAL HISTORY

Patient name: _____ Date: ____/____/____

NUTRIENT INTAKE

1. ☐ No change, adequate
2. Inadequate, duration of inadequate intake _____
   ☐ Suboptimal solid diet ☐ Full fluids or only oral nutrition supplements ☐ Minimal intake, clear fluids or starvation
3. **Nutrient intake in past 2 weeks***
   ☐ Adequate _____ ☐ Improved but not adequate _____ ☐ No improvement or inadequate _____

WEIGHT Usual weight _____ Current weight _____

1. **Non fluid weight change past 6 months** Weight loss (kg) _____
   ☐ <5% loss or weight stability ☐ 5-10% loss without stabilization or increase ☐ >10% loss and ongoing
   If above not known, has there been a subjective loss of weight during the past six months?
   ☐ None or mild ☐ Moderate ☐ Severe
2. **Weight change past 2 weeks*** Amount (if known) _____
   ☐ Increased ☐ No change ☐ Decreased

SYMPTOMS (Experiencing symptoms affecting oral intake)

1. ☐ Pain on eating ☐ Anorexia ☐ Vomiting ☐ Nausea ☐ Dysphagia ☐ Diarrhea
   ☐ Dental problems ☐ Feels full quickly ☐ Constipation
2. ☐ None ☐ Intermittent/mild/few ☐ Constant/severe/multiple
3. **Symptoms in the past 2 weeks***
   ☐ Resolution of symptoms ☐ Improving ☐ No change or worsened

FUNCTIONAL CAPACITY (Fatigue and progressive loss of function)

1. No dysfunction
2. Reduced capacity; duration of change _____
   ☐ Difficulty with ambulation/normal activities ☐ Bed/chair ridden
3. **Functional Capacity in the past 2 weeks***
   ☐ Improved ☐ No change ☐ Decrease

METABOLIC REQUIREMENT

High metabolic requirement ☐ No ☐ Yes

PHYSICAL EXAMINATION

Loss of body fat	☐ No	☐ Mild/Moderate	☐ Severe
Loss of muscle mass	☐ No	☐ Mild/Moderate	☐ Severe
Presence of edema/ascites	☐ No	☐ Mild/Moderate	☐ Severe

SGA RATING

☐ A Well-nourished/ Normal ☐ B Mildly/moderately malnourished/ Some progressive nutritional loss ☐ C Severely malnourished/ Evidence of wasting and progressive symptoms

CONTRIBUTING FACTOR

☐ **CACHEXIA** - (fat and muscle wasting due to disease and inflammation) ☐ **SARCOPENIA** - (reduced muscle mass and strength)

*See page 2 SGA Rating for more description.

April 2017

Canadian Malnutrition Task Force® | Le Groupe de travail canadien sur la malnutrition®

SNAQ

Short Nutritional Assessment Questionnaire

www.fightmalnutrition.eu

- Have you lost weight unintentionally?
  More than 6 kg in the last 6 months
  More than 3 kg in the last month
- Did you experience a decreased appetite over the last month?
- Did you use supplemental drinks or tube feeding over the last month?

- ● no intervention
- ●● moderately malnourished; nutritional intervention
- ●●● severely malnourished; nutritional intervention and treatment dietician

SCREENING FOR NUTRITIONAL STATUS: **EXAM**

- **Anthropometric findings on physical exam:**
  - BP: Salt intake
  - BMI
  - Waist Circumference (WC): Surrogate marker for visceral adipose tissue
    - Men > 102 cm
    - Women > 88 cm

SCREENING FOR NUTRITIONAL STATUS: **EXAM**

- **Non-Specific Findings** (i.e. not always nutrition-related)
  - Hair Loss: inadequate protein, B12, and folate
  - Temporal Atrophy: general muscle wasting
  - Angular Palpebritis: riboflavin deficiency
  - Oral Health: too many to list (macronutrient deficiencies, vitamin C, D, B12)
  - Glossitis/Angular Cheilosis: low vitamin B complex
  - Peripheral Edema: poor nutritional status, protein malnutrition
  - Decreased Hand Grip Strength: decreased muscle mass
  - Poor Wound Healing: lack of vitamin C/zinc/protein/calories

SCREENING FOR NUTRITIONAL STATUS: **LABS & OTHER DIAGNOSTIC STUDIES**

- **Laboratory Data**: *Sometimes helpful, sometimes not*
  - CBC
  - CMP (Albumin)
  - TSH
  - Vitamin B12 and Folate
  - Vitamin D
  - Iron Studies
  - Prealbumin
  - A1C
- **DEXA** (Osteoporosis)
- **Gastrointestinal Studies**: EGD, Colonoscopy, Barium swallow etc (GERD management, motility issues)

USING APPROPRIATE TESTS TO ANALYZE NUTRITIONAL DEFICIENCIES (INCLUDING OVERNUTRITION)

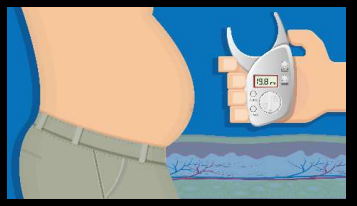
- **Basic Laboratory Data**:
  - A1C (prediabetes, diabetes)
  - Lipids*
  - CBC/ferritin/vitamin B12/folate – anemia
  - CMP (electrolytes, protein stores, albumin)
  - Uric acid (gout management)
  - Vitamin D (controversial)
  - Celiac panel
- **Nutrition Specific Labs**: Not all high yield
  - Zinc, selenium, copper, manganese
  - Vitamins B1 (thiamine), B6 (pyridoxine), A, K, E
  - Biotin

*Vary depending on fasted/non-fasted state, whether on or off statins.
CMP, comprehensive metabolic panel

USING APPROPRIATE TESTS TO ANALYZE NUTRITIONAL DEFICIENCIES (INCLUDING OVERNUTRITION)

Scanning/Procedures:

- Body Composition Studies:
  - Poor clinical application:
    Handgrip Dynometry, Skin-fold thickness – pros/cons
  - Better clinical application:
    Bioelectrical Impedance Analysis (BIA) – pros/cons
- DEXA (osteoporosis guidelines)
- Gastrointestinal Studies: EGD, Colonoscopy, Barium swallow etc (GERD management, motility issues)



DEXA, dual energy x-ray absorptiometry; EGD, esophagogastric duodenoscopy

NUTRITION CARE STARTS WITH IDENTIFYING THE PROBLEM

ASPEN Criteria: Diagnostic Criteria for Malnutrition: 2 or more of the following:

- Weight loss
  - > 10% within 6 months
  - >5% within 1 month
- Insufficient food intake
- Loss of muscle mass and/or fat mass
- Fluid accumulation (presence of edema)
- Diminished grip strength

American Society of Parental & Enteral Nutrition
American Dietetic Association

GLOBAL LEADERSHIP INITIATIVE ON MALNUTRITION (GLIP) DIAGNOSTIC CRITERIA FOR MALNUTRITION

Etiologic Criteria (cause): Must have at least 1

- Reduced Food Intake
- Increased Disease Burden or Inflammation

Phenotypic Criteria (signs): Must have at least 1

- Unintentional Weight Loss: 5-10% +++ within 6 months
- Decreased BMI: Note - use of BMI varies amongst countries
- Decreased Lean Mass: strong evidence, but no consensus regarding how best to measure and define, particularly in clinical settings.
- Fluid Retention / Ascites or Edema
- Decreased Muscle Function (grip strength)
- Biochemistry Changes (albumin, prealbumin etc)

Source: Global Leadership Initiative on Malnutrition
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6438340/

Table 4

Thresholds for severity grading of malnutrition into stage 1 (moderate) and stage 2 (severe) malnutrition

	Phenotypic Criteria [a]		
	Weight loss (%)	**Low body mass index (kg/m ^{2})** [b]	**Reduced muscle mass** [c]
Stage 1/Moderate Malnutrition (Requires 1 phenotypic criterion that meets this grade)	5–10% within the past 6 mo, or 10–20% beyond 6 mo	<20 if <70 yr, <22 if ≥70 yr	Mild to moderate deficit (per validated assessment methods – see below)
Stage 2/Severe Malnutrition (Requires 1 phenotypic criterion that meets this grade)	>10% within the past 6 mo, or >20% beyond 6 mo	<18.5 if <70 yr, <20 if ≥70 yr	Severe deficit (per validated assessment methods – see below)

NUTRITIONAL NEEDS OF AGING ADULTS

- **The aging body has specific needs**:
  - Bone Health: Calcium and Vitamin D
  - Vitamin B12
  - Reduce risk of cardiovascular disease, diabetes, and promote "regularity"
    - Higher Fiber Diets
    - Increase Hydration
  - Electrolytes: K+, Na+
  - Good Fats:
    - PUFA's (polyunsaturated fatty acids)
    - MUFA's (monounsaturated fatty acids)

https://www.eatright.org/health/wellness/healthy-aging/special-nutrient-needs-of-older-adults.

THE AGING EYE

- Goal: Prevent cataracts, macular degeneration, glaucoma
- Promote intake of **lutein** and **zeaxanthin** (related to vitamin A and beta-carotene)
  - Kale
  - Sweet potatoes
  - Strawberries
  - Fatty fish
  - Greet Tea

https://www.eatright.org/health/wellness/preventing-illness/5-top-foods-for-eye-health.

CALCULATING NUTRITIONAL NEEDS:

- **Calculating CALORIE Needs:**
  - Harris Benedict Equation
  - Online Calculators: There are many
  - Considerations: Ideal Body Weight (IDW) VS. Actual Body Weight (ABW)

- The "**Practical Method**" – to be used with Actual Body Weight (ABW)
  - For Weight Gain: 25-30 kcal/kg/day
  - For Weight Maint: 20-25 kcal/kg/day
  - For Weight Loss: 15-20 kcal/kg/day

- Ideal Body Weight (IBW): Hamwi Method
  - Men: 106 lbs for the first 5 feet, then 6 lbs for every inch thereafter (+/-10%)
  - Women: 100 lbs for the first 5 feet, then 5 lbs for every inch thereafter (+/- 10%)

CALCULATING NUTRITIONAL NEEDS:

- **Protein: 1** g = 4kcal (10 g Protein = 40 calories)
  - Total Protein: 10-20% total daily calories
  - Example: 2,000 calorie diet = 200-400 calories from protein, which is 50g-100g protein per day.

- Weight-Based Protein Needs:
  - Sedentary Adults (18-49 y/o): 0.8 g/kg/day
  - Active Adults (18-49 y/o): 1.0 g/kg/day (1.2-1.8 g/kg/day if on daily exercise regimen)
  - Obesity: 1.5-2 g/kg IBW (not actual body weight)
  - **Older Adults (> 50 y/o): 1.0-1.2 g/kg/day (this is a great starting recommendation)**

- When to Refer to a Registered Dietitian (RD)?
  - Wounds: 1.5-2.0 g/kg/day
  - Renal Disease, Liver Disease, Cancer, Pulmonary Disease, Organ Transplant

LEAN BODY MASS

- Optimizing protein consumption
  - Estimated that 38% of men and 41% of women have dietary intakes <RDA
- Sarcopenia: Loss of muscle mass & strength
- Less responsive to anabolic stimulus
  - Improves with increased protein intake

- Experts recommend a protein intake between 1.2 and 2.0 g/kg/day or higher (RDA recommended intake is 0.8 g/kg/day) for 65 y/o +
  - Up to 30-35% of total caloric intake
  - Protein intake may need to be restricted in patients with advanced renal or liver disease

Source: Baum JI et al. *Nutrients.* 2016,8(6),359; doi:10.3390/nu8060359.

CALCULATING NUTRITIONAL NEEDS:

- **Carbohydrates:** 4 kcal/g (10g Carbs = 40 calories)
  - Total Carbhohydrates: ~45-65% total daily calories
  - Example: 2,000 calorie diet = 900-1,300 calories from carbohydrates, which is 225g-325g carbohydrates per day.
- Fiber: ≥ 25 g/day

- **Fats**: 9 kcal/g (10 g fat = 90 calories)
  - Total Fat: <30 % of total daily calories
  - Saturated Fat: < 7% of total daily calories
  - Example: 2,000 calorie diet = 600 calories from fats, which is 66g of fat and less than 5g saturated fat per day.

CALCULATING FLUID NEEDS:

- **Holliday-Segar Method:**
  - < 10 kg 100 mL/kg
  - 11-20 kg 1000 mL/kg + 50 mL/kg for each kg > 10kg
  - >20 kg 1500 mL + 20 mL/kg for each kg > 20 kg

- **RDA Method:** the "practical method"
  - 1 cc fluid per 1 kcal of estimate needs

MICRONUTRIENT NEEDS: RDA'S (VS) TREATING DEFICIENCIES

- Calcium: RDA = 1,200mg daily
- Vitamin D: RDA = 800-1,000 IU's daily
  - Tx: 50,000 IU's once weekly x 12 weeks
- Cobalamin (Vitamin B12): RDA = 2.4 mcg/day
  - Tx: 1,000-3,000 mcg/day
- Pyridoxine (Vitamin B6): RDA = 1.5-1.7 mcg/day
  - Tx: 10-20 mcg/day x 3 weeks
- Iron: RDA = 8 mg/day
  - Tx: Ferrous Sulfate 325mg QD-BID (~65 mg of elemental iron)
- Magnesium: RDA = 320 (F) – 420 (M) mg/day
  - Tx: caution in renal disease
- Vitamin E: RDA = 15 mg/day
  - Tx: 100-400 mg/day

- What about a general multi-vitamin (MVI)?
  - If nutritionally compromised? It's generally recommended, but evidence remains weak.

TREATMENT OF MALNUTRITION SYNDROMES:

- **General Approach:**
  - Identify the relevant risk factors and minimize the impact
  - Identify and remove the barriers
  - Provide a recommendation or "prescription" for dietary needs.
  - Identify foods, supplements, and programs (i.e. meals on wheels etc) that are needed to meet dietary needs
  - Monitor Progress (intakes, weight, labs, dexa, mobility, strength)

TREATING MACRONUTRIENT DEFICIENCIES & MALNUTRITION SYNDROMES:

- **Undernutrition Malnutrition**:
  - **Calorie Malnutrition**: Replace calories (food +/- supplementation)
  - **Protein Malnutrition**: Replace protein (food +/- supplementation)
- **Anorexia**: Stimulate their Appetite
- **Cachexia**: Supplementation
- **Sarcopenia**: Focus on Protein
- **Obesity & Sarcopenic Obesity**: Calorie Restriction with Adequate Protein Intake
  - don't forget the exercise (strength training)

COMMONLY AVAILABLE SUPPLEMENTS FOR ELDERLY MALNUTRITION

Powders	Company	Product Name	Usage
	Nestle	Sustagen, Sustagen Neutral	Create milk drink supplements or fortify meals
	Abbott	Ensure Powder	
	Proform	Proform	
	Prime Nutrition	Enprocal	
	Nutricia	Polyjoule	
1.0–1.5 cal/ml	Abbott	Ensure, Ensure Plus	Used as routine milk based supplement
	Nutricia	Fortisip	
	Nestle	Resource Protein, Resource Plus	
Fruit Based	Nutricia	Fortijuice	Residents who prefer fruit-based fluids over milk-based fluids
	Nestle	Resource Fruit Beverage	
	Abbott	Enlive Plus	
2.0 cal/ml	Abbott	TwoCal	Residents with very small appetites and provided with medication rounds
	Nestle	Resource 2.0, Benecalorie	

https://www.leadingnutrition.com.au/oral-nutritional-supplements-the-pros-cons-and-how-they-can-be-part-of-weightloss-management/

MEDICATIONS:

- Studies are limited.
- May consider on a case by case situation.
- Consider the side effects (sedation and risk of falls)
- Appetite Stimulants:
  - Mirtazapine
  - Dronabinol
  - Magestrol Acetate
  - Cannabis?

SUMMARY:

- Nutrition is important!
- PA's play an important role in nutrition advocacy!
- When in doubt, let the RD help out! (Refer)

QUESTIONS?

- Thank you!
- Email: darrin.cottle@aruplab.com

POST-TEST: QUESTION 1

- **All of the following signs are potential risks for malnutrition in adults 50 years and older; however, which of the following signs are the MOST WORRISOME indicators of nutritional risk for malnutrition?**

A. Change in appetite and unintentional weight loss
B. Low and fixed level of income
C. Changes in sense of taste and smell
D. Isolation and changes in mobility

POST-TEST: QUESTION 2

- **In adults 50 years and older, what is an appropriate amount of daily calcium and vitamin D intake?**

A. 800 mg Calcium + 400 IU's Vitamin D
B. 1000 mg Calcium + 400 IU's Vitamin D
C. 1000 mg Calcium + 800 IU's Vitamin D
D. 1200 mg Calcium + 1000 IU's Vitamin D

POST-TEST: QUESTION 3

- **In otherwise healthy adults 50 years and older with no major medical conditions, what is an appropriate starting amount of protein per day?**

A. 0.8 mg Protein/kg/day
B. 1.0-1.2 mg Protein/kg/day
C. 1.2-1.4 mg Protein/kg/day
D. 1.4-1.6 mg Protein/kg/day

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  - American Dietetic Association
  - American Geriatric Society
  - NHANES