



NUTRITION AND THE SCIENCE OF AGING: CHANGING NUTRITION NEEDS

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NUTRITION AND THE SCIENCE OF AGING- PART 1

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AGENDA

- Physiology of Aging
- Biological changes
- Functional changes
- Nutrition concerns
- Malnutrition
- Nutrition screening
- Identifying Risk
- Take Home Messages
- Call to Action



LEARNING OBJECTIVES

Upon successful completion of these webinars, the participant should be able to:

- Understand the *biological, physical and functional changes* associated with aging
- Recognize the *changing nutrition needs* in the older adult
- Identify *risk factors for malnutrition* in older adults
- Implement *practical techniques* to improve nutrition status in older adults



PHYSIOLOGY OF AGING

GI Tract

- Xerostomia
- Poor dentition
- Altered taste/smell
- ↓ esophageal reflexes
- ↑ gallstone formation
- ↓ glucose tolerance
- ↓ insulin & beta-cell
- ↓ metabolic capacity of the liver
- ↓ hepatic drug clear
- ↑ Fecal incontinence

Other Organs

- ↓ skin elasticity
- ↑ AMD & hearing loss
- Thickening of heart
- ↓ breathing capacity
- ↓ GFR, renal blood flow
- ↓ sensory perceptions
- ↓ cognition, memory
- Loss of LBM
- Degeneration of joints
- Decalcification of bone



BIOLOGICAL CHANGES

- **Dry mouth**

- Dental health
- Swallowing
- Taste



- **Altered taste/smell**

- Flavor matters

- **Organs work differently (diminished)**



PHYSICAL CHANGES

- **Decreased skin elasticity**
 - ↑ risk of pressure injury & skin tears
- **Loss of muscle**
 - Sarcopenia
- **Weaker bones**
 - ↑ fracture risk
- **Fall risk**



FUNCTIONAL CHANGES

- **Mobility**
- **Weakness**
 - Prepare meals
 - Eat independently
- **Poor dentition**
 - Dentures
 - Chewing difficulty
- **Decrease in cognition and memory**
 - Impacts dietary intake
 - Independence



HEALTHY AGING

- **How you live affects how you age:**
 - Nutrition & Hydration
 - Physical Activity
 - Sleeping Habits
 - Mental Health
 - Lifestyle Choice (ex. smoking, drinking)

- **Never too late to make changes**



POLL

Approximately 10-30% of older adults are unable to absorb food sources of this nutrient:

- a. Vitamin B-6
- b. Vitamin B-12
- c. Calcium
- d. Vitamin D



CHANGING NUTRITION NEEDS: CONCERNS

- Key nutrients
 - **Protein** (↑ needs)
 - **Fiber** (↓ needs)
 - **Vitamin B-12**
 - **Vitamin B-6** (↑ needs)
 - **Calcium** (↑ needs)
 - **Vitamin D** (↑ needs)



CHANGING NUTRITION NEEDS: CONCERNS

- **Other concerns:**
 - Malnutrition
 - Unintended weight loss
 - Muscle loss

- **Maintaining independence**



MALNUTRITION

- **Definition:**
- 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.

MALNUTRITION IN HOSPITALIZED PATIENTS

ASSOCIATED WITH HIGHER COSTS, LONGER STAYS & INCREASED MORTALITY

1.95 million

hospital stays involved malnutrition in 2013



Malnutrition is associated with:

Economic Burden

Hospital stays involving malnutrition accounted for

\$42 billion



Human Cost

Most malnutrition-related stays have a substantially higher proportion of in-hospital deaths

1.5x to 5x higher

than those unrelated to malnutrition



Longer Hospital Stays

Most hospital stays were

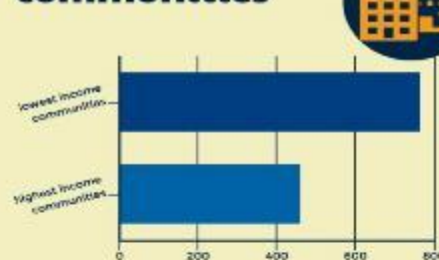
2x longer

47%-71% of patients with malnutrition did not have a routine discharge



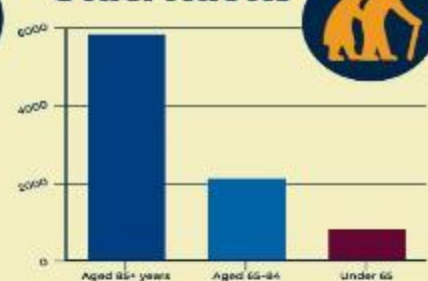
Rate of malnutrition is highest:

In lowest income communities



Malnutrition Related Hospital Stays per 100,000 Population

Older Adults



Malnutrition Related Hospital Stays per 100,000 Population

Understand the impact of malnutrition.
Learn more at: www.nutritioncare.org/malnutrition



MALNUTRITION

- Up to **1 in 2 older adults** are at risk for malnutrition
- **Malnutrition can cause:**
 - Medical complications
 - Increased fall risk
 - Longer hospital stays
 - Readmissions to the hospital
 - Loss of independence
 - Death



MALNUTRITION

Consensus Statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition

- **Characteristics recommended for the diagnosis of adult malnutrition (2 or more):**
 - Insufficient energy intake
 - Weight loss
 - Loss of muscle mass
 - Loss of subcutaneous fat
 - Localized or generalized fluid accumulation
 - Diminished hand-grip strength.



UNINTENDED WEIGHT LOSS

- **Unintended weight loss**

- 5% in 30 days
- 7.5% in 90 days
- 10% in 180 days



- **Insidious weight loss:** gradual unintended weight loss over time (i.e. 1-2 lbs monthly)

$$\text{Percentage of loss} = \frac{\text{Usual Body Wt} - \text{Current Body Wt}}{\text{Usual Body Wt}} \times 100$$



A WORD ON WEIGHT: BMI

- **BMI:** Body Mass Index
- **BMI Table for Adults:**

Range	Category
>18.5	Underweight
18.5 - 24.9	Normal
25 - 29.9	Overweight
30+	Obese



BODY MASS INDEX (BMI)

- Meta-analysis BMI & all-cause mortality >65 years
- U-shaped relationship:

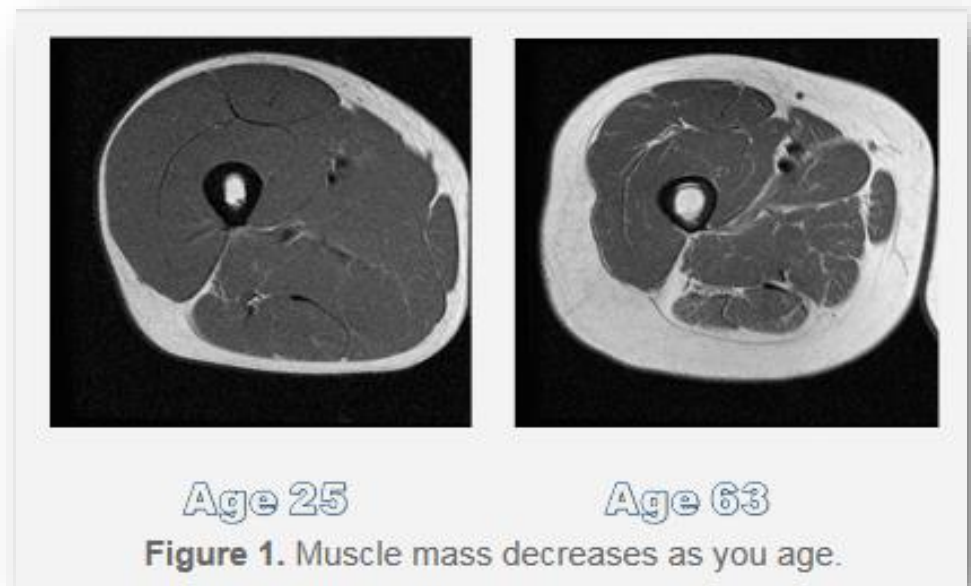


- Optimal BMI >65 years of age: 24-30

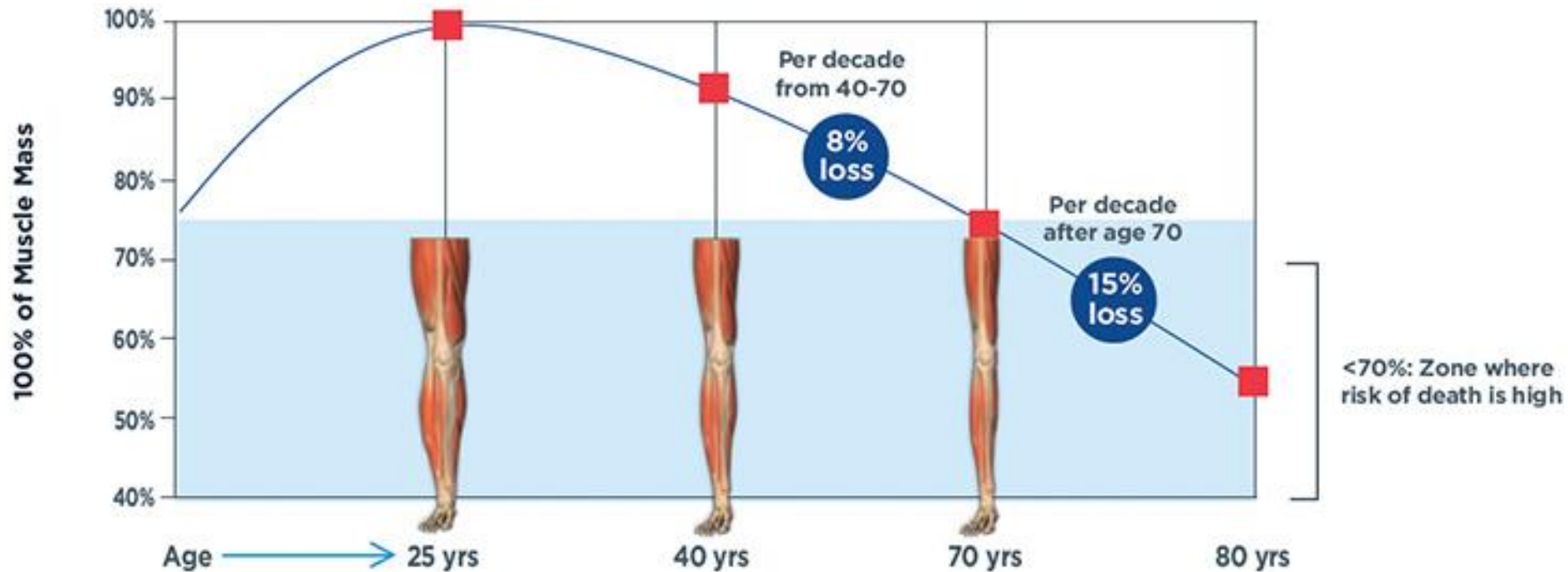


MUSCLE LOSS: SARCOPENIA

- **Definition:** Decline of skeletal muscle tissue with age.
- **Major cause of:**
 - Functional decline
 - Loss of independence



MUSCLE LOSS: SARCOPENIA



MUSCLE LOSS: SARCOPENIA

- **NHANES data**
- Older women w/ sarcopenia cause mortality risk
- Independent of obesity

- **CRIME Study data**
- Hospitalized older adults sarcopenia associated w/
 - short- term mortality (6% vs 2%)
 - long-term mortality (36% vs 14%)



POLL

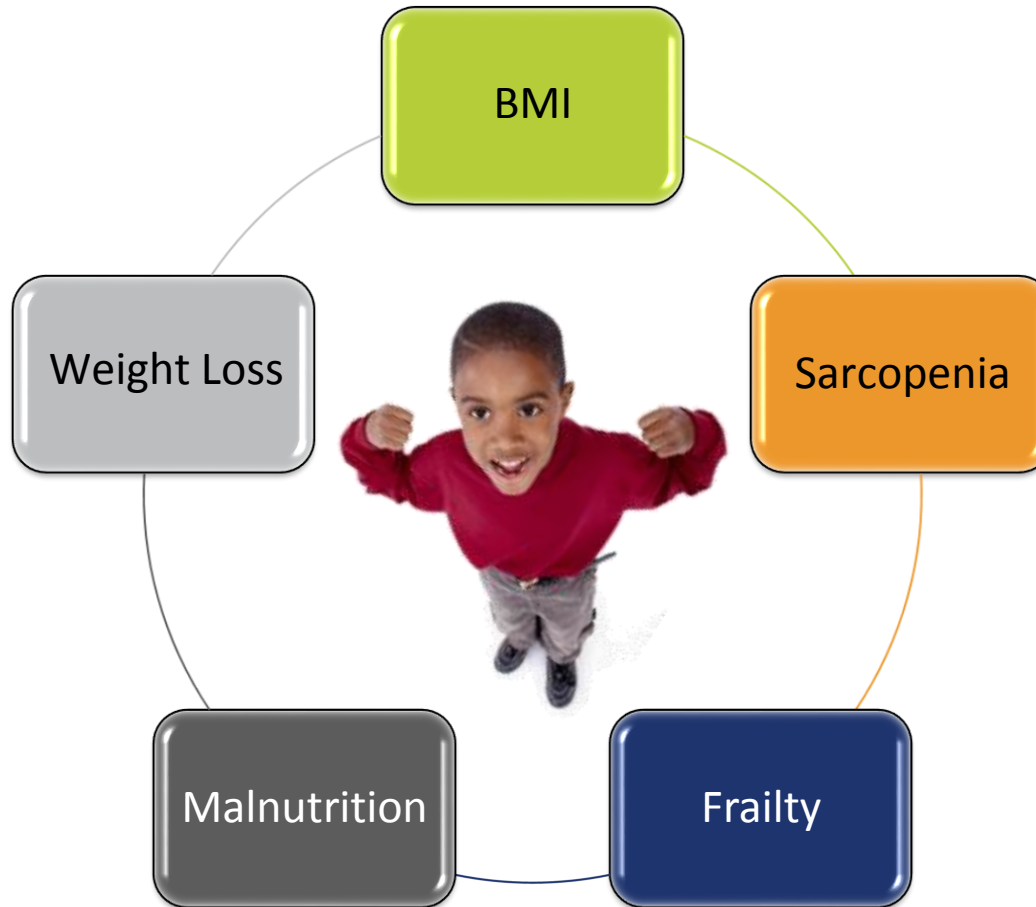
How much does an UWL of $\geq 5\%$ in 30 days increase the likelihood of death?

- a. None
- b. Double
- c. Triple
- d. Ten-fold



UNINTENDED WEIGHT LOSS

- UWL \geq 5% in 30 days \rightarrow 10x \uparrow death



NUTRITION SCREENING

- **Mini Nutrition Assessment (MNA)**
 - Validated nutrition screening tool for elderly
 - Malnourished, At Risk, Normal
- **Short-form (6 questions)**
 - Food intake decline
 - Weight loss
 - Mobility
 - Psychological stress or acute disease
 - Neuropsychological problems
 - BMI

The image shows a screenshot of the Mini Nutritional Assessment (MNA) form. The form is titled "Mini Nutritional Assessment" and "MNA®" with the Nestlé Nutrition Institute logo. It includes fields for "Last name:" and "First name:". Below these are fields for "Sex:", "Age:", "Height (kg)", "Height (cm)", and "Date:". The main section is titled "Screening" and contains six questions (A-F) with multiple-choice options and checkboxes for answers. Question A asks about food intake decline over the past 3 months. Question B asks about weight loss during the last 3 months. Question C asks about mobility. Question D asks about psychological stress or acute disease. Question E asks about neuropsychological problems. Question F asks about Body Mass Index (BMI). Below the questions is a "Screening score (max. 14 points)" section with a legend: 12-14 points: Normal nutritional status; 8-11 points: At risk of malnutrition; 0-7 points: Malnourished.



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

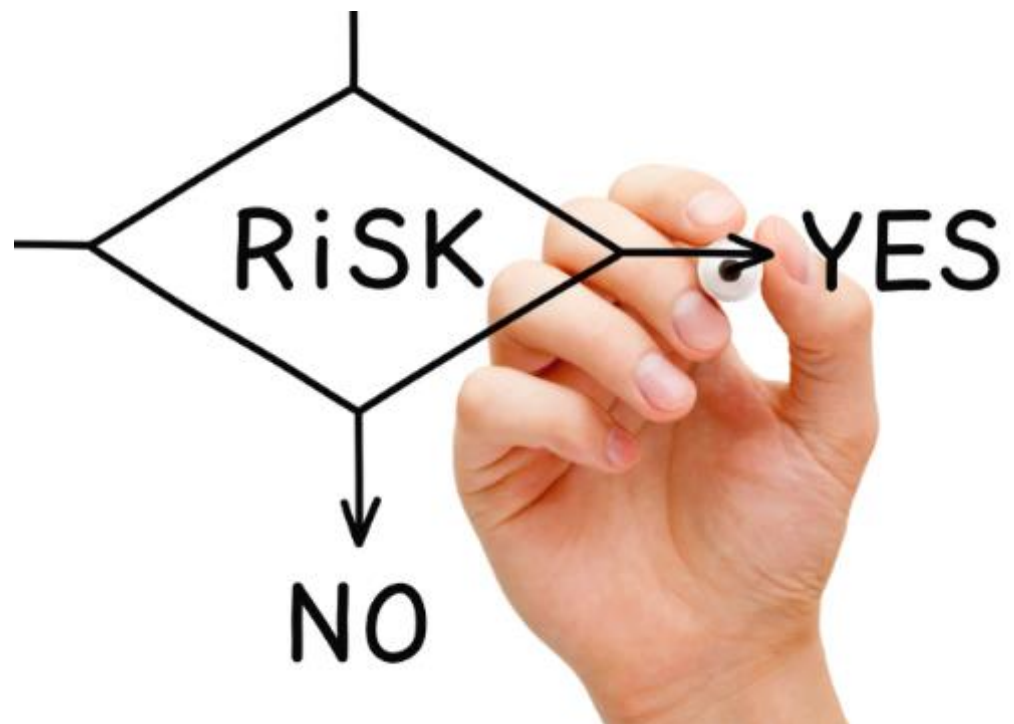
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IDENTIFYING RISK

- **Risk Factors:**

- Dietary restrictions
- Catabolic illness
- Blood loss
- Poor appetite
- Dysphagia
- Polypharmacy
- Malabsorption
- Psychosocial
- Low client-activation
- Dementia
- Knowledge deficit



TECHNIQUES TO IMPROVE NUTRITION STATUS

- Identified risk: **now what?**
 - **Referral** to health care team (dietitian)
 - **Investigate** root cause
 - Implement **strategies** to improve intake



REFERRAL TO HEALTH CARE TEAM

- Positive nutrition screen -> referral to dietitian

- **Health care team members:**

- Medical provider
- Registered dietitian
- Physical therapist
- Occupational therapist
- Speech therapist
- Psychologist
- Social worker
- Dentist
- Pharmacist

WORKING WITH
**COMMUNITY-BASED
PRACTITIONERS**



POLL

How many older adults struggle with hunger?

- a. 1 in 3
- b. 1 in 6
- c. 1 in 10
- d. 1 in 25



GETTING TO THE ROOT CAUSE: EXAMPLE

- **Statistics:**
 - 1 in 6 older adults struggle with hunger
 - 15.2 million older adults are isolated & live alone
 - 9.6 million older adults are threatened by hunger
 - 18.4 million are living at or near poverty
- Could one of these be the root cause?



GETTING TO THE ROOT CAUSE

- Screen positive for:
 - Malnutrition
 - At risk for malnutrition
- **Root cause:**
 - WHY?
- **Investigate:**
 - Review screen & risk factors
 - Utilize health care team



GETTING TO THE ROOT CAUSE

- Unintended weight loss (UWL) is a **symptom**.
- Investigate the root cause (WHY)
 - No appetite... illness, mental health, medications
 - Increased nutritional needs
 - Dysphagia
 - Chewing problems or oral pain
 - Social issues
- 1 in 4 older adults with UWL... no obvious cause can be identified



STRATEGIES TO IMPROVE INTAKE: EXAMPLES

Food and/or Nutrient Delivery

- Meals and Snacks
- Medical Food Supplement Therapy
- Feeding/Dining Assistance
- Managing Feeding/Dining Environment
- Nutrition-Related Medication Management
- Other



STRATEGIES TO IMPROVE INTAKE

- Key Nutrients:
 - **Protein** (↑ needs)
 - **Fiber** (↓ needs)
 - **Vitamin B-12**
 - **Vitamin B-6** (↑ needs)
 - **Calcium** (↑ needs)
 - **Vitamin D** (↑ needs)
- **Next week cover:**
 - Needs, food sources, strategies



STRATEGIES TO IMPROVE INTAKE

MyPlate for Older Adults



<https://hnrca.tufts.edu/myplate/>



WRAPPING IT UP

Hopefully you now:

- Understand the *biological, physical and functional changes* associated with aging
- Recognize the *changing nutrition needs* in the older adult
- Identify *risk factors for malnutrition* in older adults
- Implement *practical techniques* to improve nutrition status in older adults



TAKE HOME MESSAGES

- Physiology of **aging is complex**
- Unintended weight loss & **malnutrition** are serious issues
- Complete nutrition **screens**
- **Referrals** to health care team
- Investigating **root cause**
- Implement **strategies** to improve nutrition status



CALL TO ACTION

- **Evaluate** current system for screening/assessment
- Identify areas for **improvement**
- **Involve** older adults in nutrition strategies
- **Initiate change** to improve nutrition



REFERENCES

1. Niedert K, Carlson M. *Nutrition Care of the Older Adult*. Academy of Nutrition and Dietetics: Chicago, IL; 2016.
2. <https://www.nutritioncare.org/Malnutrition>
3. Malnutrition: An Older-Adult Crisis. Defeat Malnutrition Today website. http://defeatmalnutrition.today/sites/default/files/documents/CMKT_15_00385a_Malnutrition_Info_Graphic_OnePage_Update_FA.pdf. Accessed December 6, 2019.
4. White, J. V., P. Guenter, and G. Jensen. "Characteristics recommended for the identification and documentation of adult malnutrition (undernutrition)." *J Acad Nutr Diet* 112 (2012): 730-8.
5. Centers for Medicare and Medicaid Services (CMS). State Operations Manual (SOM) Guidance to Surveyors for Long Term Care Facilities. Appendix PP. Rev. 70. 01-07.
6. Winter JE, MacInnis RJ, Wattanapenpaiboon N, Nowson CA. BMI and all-cause mortality in older adults: a meta-analysis. *Am J Clin Nutr*. 2014;99:875-890.
7. Batsis, J. A., et al. "Sarcopenia, sarcopenic obesity and mortality in older adults: results from the National Health and Nutrition Examination Survey III." *European journal of clinical nutrition* 68.9 (2014): 1001-1007.
8. Vetrano, Davide L., et al. "Association of sarcopenia with short-and long-term mortality in older adults admitted to acute care wards: results from the CRIME study." *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences* 69.9 (2014): 1154-1161.
9. Meals on Wheels America. https://www.mealsonwheelsamerica.org/docs/default-source/factsheets/2019/2019-national/mowa2019factsheets_issue_final.pdf?sfvrsn=b92bb93b_2



QUESTIONS?

UPCOMING TRAINING



Nutrition and the Science of Aging

- **What:** Part #2 - Webinar
- **When:** Tuesday, December 19, 2019
- **To Register:** Online



THANK YOU!



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www.nutritionandaging.org

