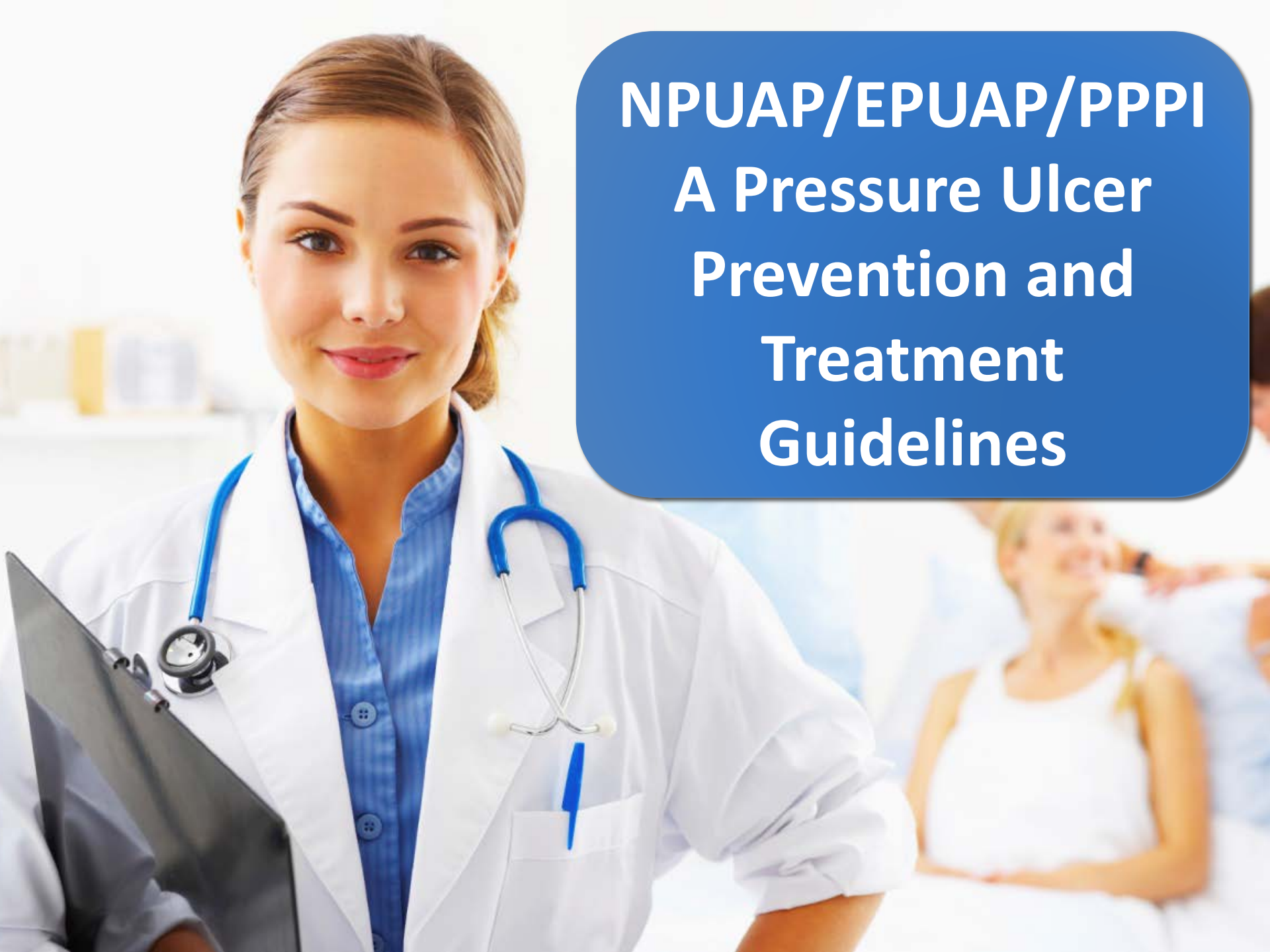
NUTRITION STRATEGIES FOR PRESSURE INJURY MANAGEMENT

MARY ELLEN POSTHAUER, RDN, LD, FAND




Objectives

1. Recognize the importance of screening and assessment to identify malnutrition and pressure injury risk
2. Examine the building block of nutrition (macronutrients and micronutrients) that dominate healing
3. Apply the 2014 NPUAP/EPUAP/Pan Pacific Pressure Injury Alliance nutrition guidelines into practice
4. Define practical nutrition and hydration strategies for healing pressure injuries



NPUAP/EPUAP/PPPI A Pressure Ulcer Prevention and Treatment Guidelines

Strength of Recommendations (SOR)
Assists Health Professionals Prioritize Interventions

Strong positive recommendation: definitely do it

Weak positive recommendation: probably do it

No specific recommendation

Weak negative recommendation: probably don't do it

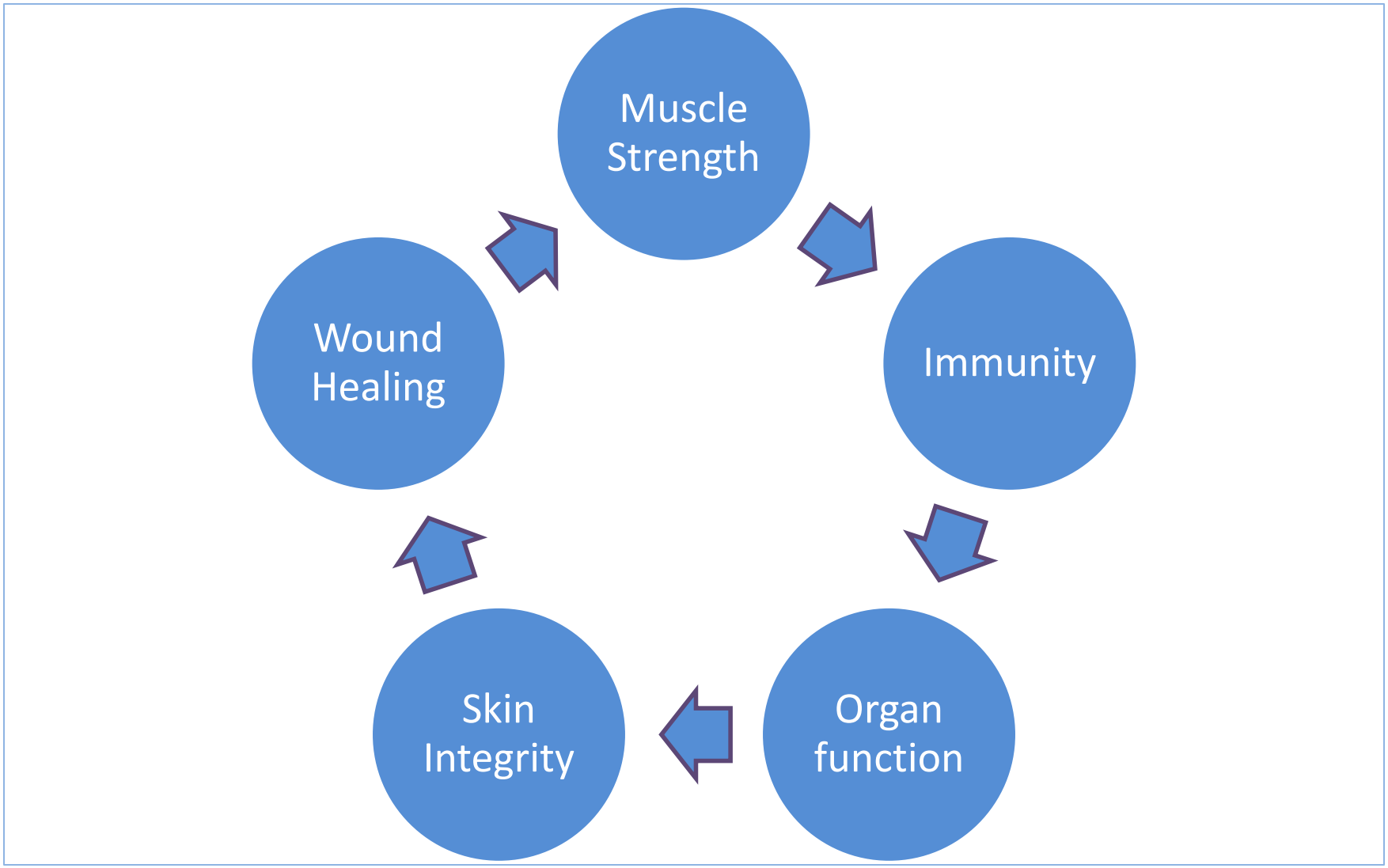
Strong negative recommendation: definitely don't do it

2014 Prevention and Treatment of Pressure Ulcers:
Clinical Practice Guideline

Malnutrition: problem across all settings

- 2011 John Hopkins study indicated 53% of patients are malnourished
- 37% of patients hospitalized for 1-2 days experience LBM loss
- LTC- 21-51%
- Outpatient/home care 13-30%

Lean Body Mass is Essential for:



Loss of Lean Body Mass Counts

Loss of LBM	Complications	Associated Mortality
10%	↓immunity, ↑ infections	10%
20%	↓ healing, weakness, infection	30%
30%	too weak to sit, pressure ulcers, pneumonia, no healing	50%
40%	**DEATH,** usually from pneumonia	100%

R. Demling

Malnutrition

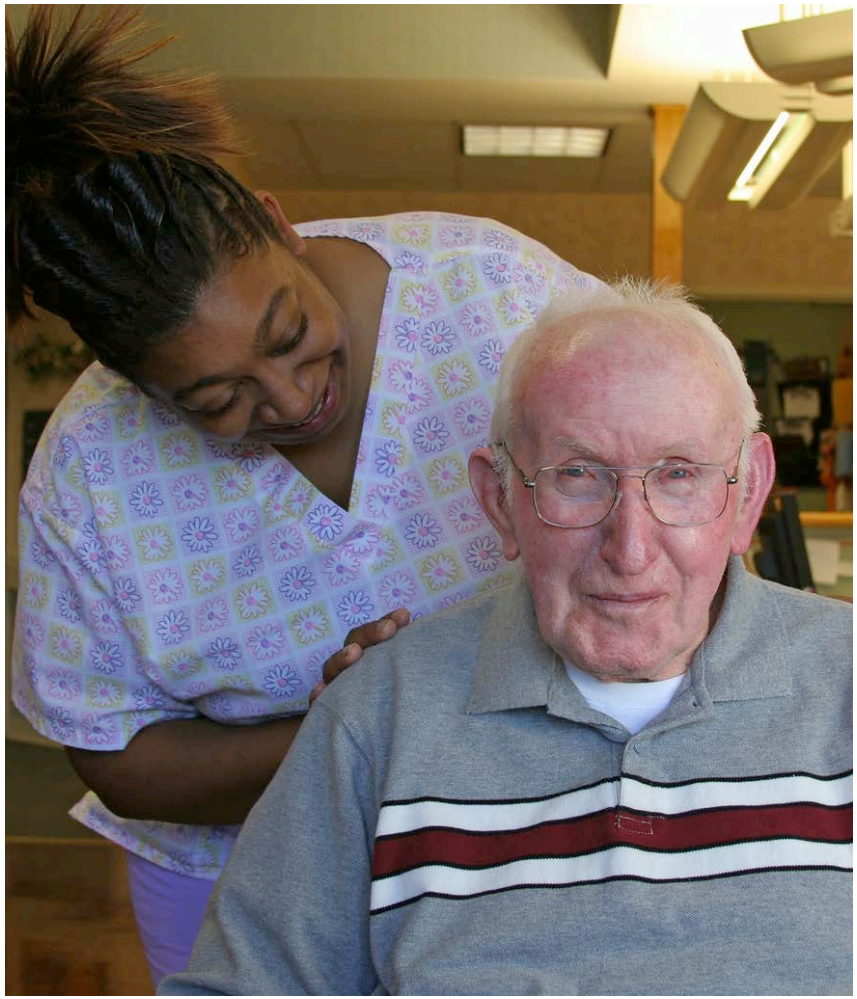
- Increases morbidity and mortality.
- Decreases function and quality of life.
- Increases frequency and length of hospital stay.
- Increases health care costs.

White, 2012 J Acad Nutr Diet. 2012 112(5): 730-738

Inflammation and Malnutrition

- Inflammation (d/t infection, injury, surgery, etc.): an important underlying factor that increases risk for malnutrition.
- May contribute to suboptimal response to nutrition intervention and increased risk of mortality.

White J, *J Acad Nutr Diet* 2012:112:730-730



Malnutrition

Fry

- Pre-existing malnutrition/weight loss increased the odds of developing a PU 3.8 times. (2010

Banks

- Australia, odds ration of having a pressure ulcer are higher with malnutrition in acute and LTC. (2010)

Iizaka

- Home care study in Japan: ≥ 65, rate of malnutrition 58.7% with pressure ulcers compared to 32.6% without them. (2010

Rasero

- Acute care, LTC & home care study of older adults,88% at PI risk had inadequate nutrition. (2013)

Medical Nutrition Therapy Protocol for Pressure Injury Management

- Does your organization have a MNT protocol for pressure injuries?
- Is it interprofessional?
- Does it result in positive outcomes for your patient?

Medical Nutrition Therapy Pressure Injury Guideline

Background:

- Medical nutrition therapy (MNT) is an integral part of the wound management plan. Without adequate nutrition and hydration, healing is prolonged and quality of life diminishes.
- Consumption of adequate calories and protein supports collagen and nitrogen synthesis, which is essential for healing. When it is not possible to achieve adequate levels of these essential nutrients through normal consumption of food, nutritional supplementation is necessary and has been clinically shown to promote wound healing.
- Pressure injuries remain a major healthcare problem despite the advances in medical treatment modalities and support surfaces, especially for older adults whose nutritional status is often compromised.
- **The management of pressure injuries requires a collaborative, interdisciplinary team approach that includes the individual, family, and/or caregiver.**

Guide for Pressure Injury Management

Trigger conditions: Nursing Assesses

- Braden Scale < 16
- MNA-SF ≤ 11 or validated screening tool indicates malnutrition risk
- Unintended wt. loss ≥ 5% in 30 days, ≥10% in 180 day
- Poor oral intake
- Immobility, decline in ADLs
- Infections (UTI)
- Diagnosis of under-nutrition/malnutrition/hydration deficits
- Decline in ability to eat independently
- Chewing/swallowing problem/dysphagia
- Co-morbid conditions: end-stage renal disease, CHF, diabetes
- Cognitive impairments
- Skin exposure to urinary or fecal incontinence
- History of Pressure injury

Algorithm for Prevention of PIs

Trigger conditions: UWL poor oral intake, immobile , swallowing concerns, low PU risk assessment score, risk of malnutrition per validated nutrition screen

Screen & Assess: using validated screening tool & refer to registered dietitian or nutrition team to assess & document malnutrition & PU risk

Nutrition Screening

1. Screen nutritional status for each individual at risk of or with a pressure ulcer:

- at admission to a health care setting;
- with each significant change of clinical condition; and/or
- when progress toward pressure ulcer closure is not observed. (SOE=C,SOR = Probably do it)

2. Use a valid and reliable nutrition screening tool to determine nutritional risk. (SOE = C, SOR= probably do it)

3. Refer individuals screened to be at risk of malnutrition and individuals with an existing pressure ulcer to a registered dietitian or an interprofessional nutrition team for a comprehensive nutrition assessment. (SOE = C; SOR=Probably do it.)

Validated Screening Tools

MST Malnutrition Valid and reliable for use in ***acute care and ambulatory care*** to identify malnutrition

(Ferguson, M et al. 1999)

MNA Mini-Nutritional Assessment

Validated in *individuals/ Pus Langkamp-Henken et al.(2005)*

Validated and easy to use in older adults

(Paudlia 2012)

MUST Malnutrition Universal Screening Tool

To identify risk of undernutrition (Poulia et al.2012)

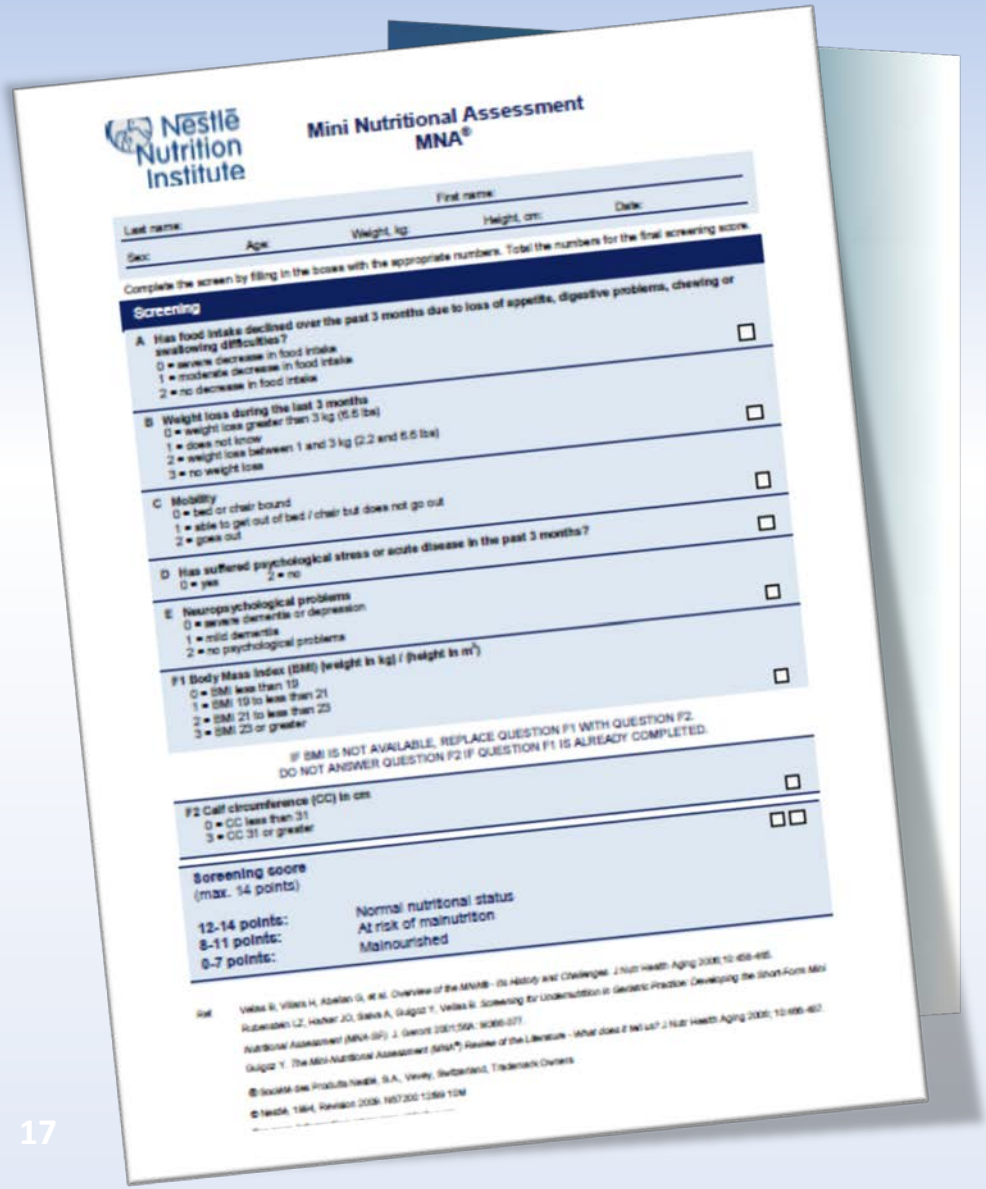
Validated for use in ***older adults admitted to acute care***

SNAQ Short Nutrition Assessment Questionnaire

Acute care, residential care and community adults .

Neelemant et al.(2008)

Mini Nutritional Assessment®


Nestlé Nutrition Institute

Mini Nutritional Assessment
MNA®

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 m²)
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

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 Gerontol 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.

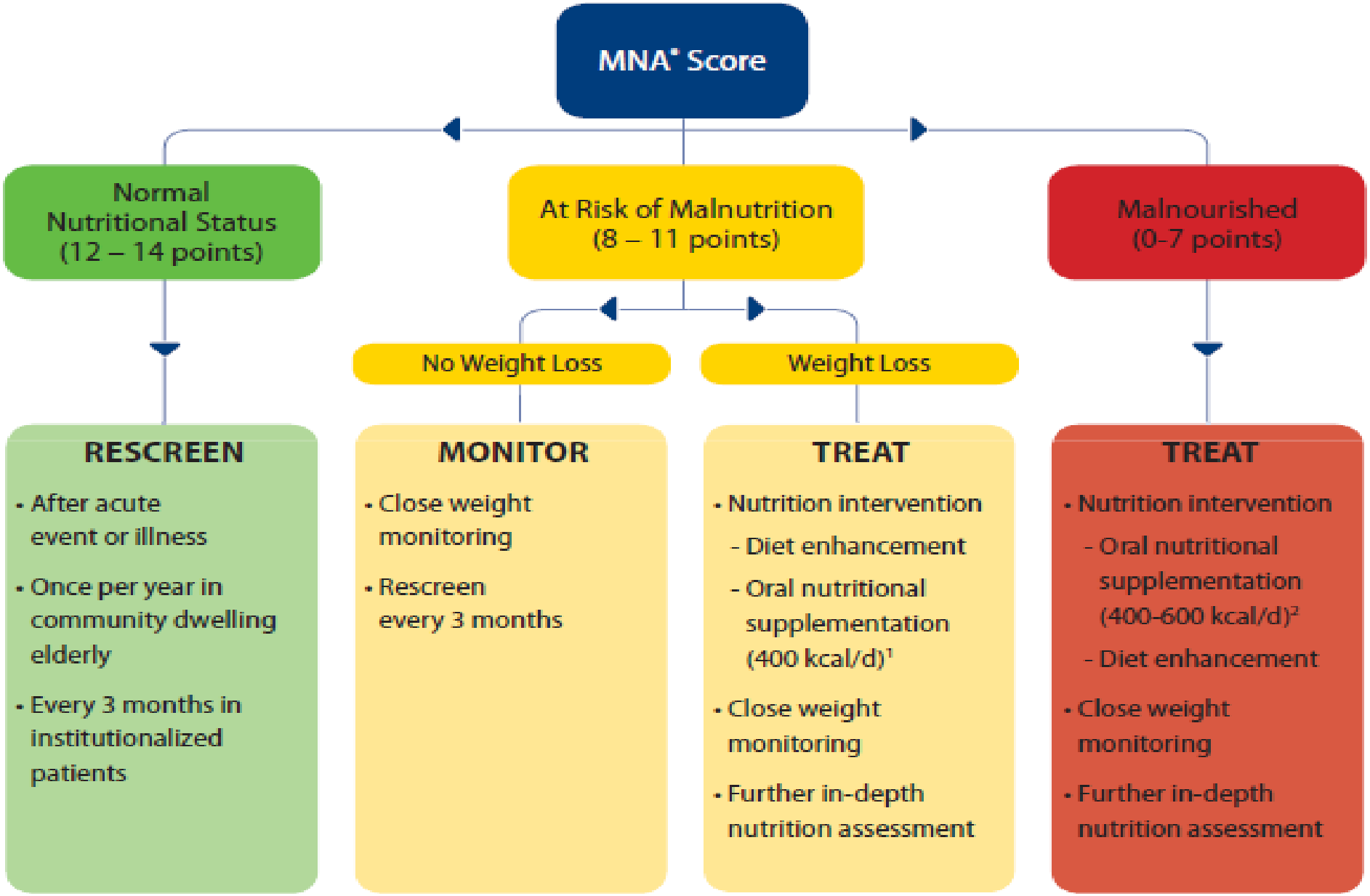
MNA®

Validated and easy
to use in geriatric patients

Acute care, hospital based
ambulatory care, LTC

http://www.mna-elderly.com

Recommendations for Intervention



1. Milne AC, *et al. Cochrane Database Syst Rev.* 2009:2:CD003288 2. Gariballa S, *et al. Am J Med.*2006;119:693-699

Malnutrition Screening Tool (MST)

STEP 1: Screen with the MST

1 Have you recently lost weight without trying?

No	0
Unsure	2

If yes, how much weight have you lost?

2-13 lb	1
14-23 lb	2
24-33 lb	3
34 lb or more	4
Unsure	2

Weight loss score: _____

2 Have you been eating poorly because of a decreased appetite?

No	0
Yes	1

Appetite score: _____

Add weight loss and appetite scores

MST SCORE: _____

STEP 2: Score to determine risk

MST = 0 OR 1
NOT AT RISK

Eating well with little or no weight loss

If length of stay exceeds 7 days, then rescreen, repeating weekly as needed.

MST = 2 OR MORE
AT RISK

Eating poorly and/or recent weight loss

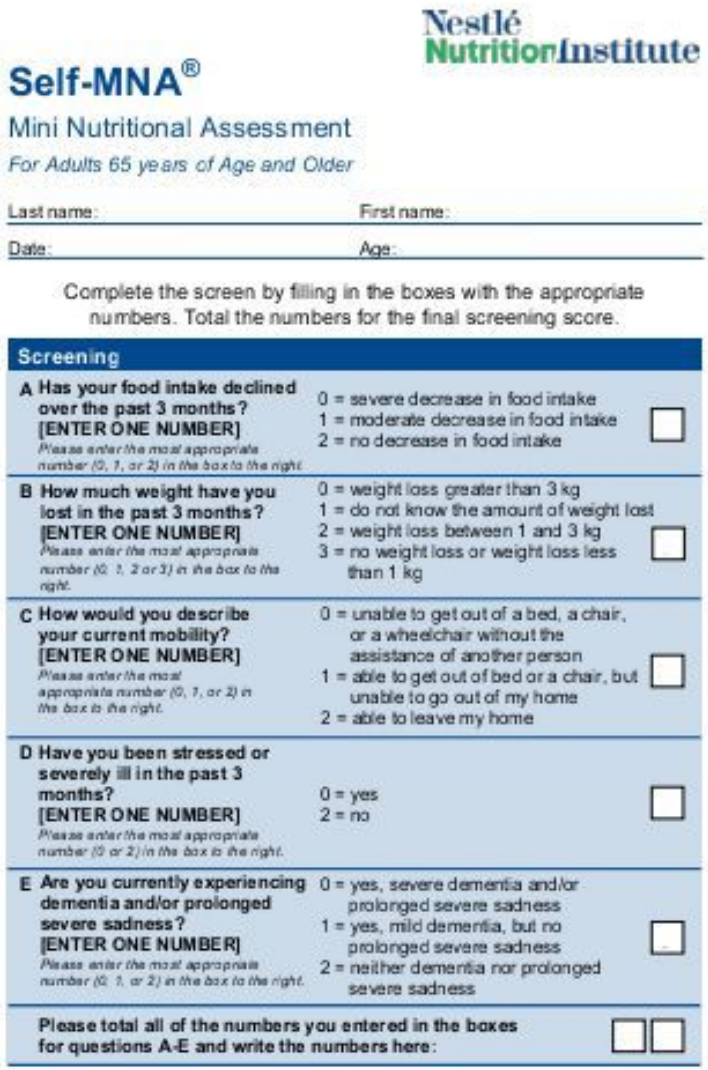
Rapidly implement nutrition interventions. Perform nutrition consult within 24-72 hrs, depending on risk.

STEP 3: Intervene with nutritional support for your patients at risk of malnutrition.

Notes: _____

Self-MNA – 65 +

- Easy to use
- May help when staff if limited or busy
- Does raise awareness about possible nutrition related problems



Nestlé NutritionInstitute

Self-MNA®

Mini Nutritional Assessment

For Adults 65 years of Age and Older

Last name: First name:

Date: Age:

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

Screening

A Has your food intake declined over the past 3 months? [ENTER ONE NUMBER] *Please enter the most appropriate number (0, 1, or 2) in the box to the right.*	0 = severe decrease in food intake 1 = moderate decrease in food intake 2 = no decrease in food intake	☐
B How much weight have you lost in the past 3 months? [ENTER ONE NUMBER] *Please enter the most appropriate number (0, 1, 2 or 3) in the box to the right.*	0 = weight loss greater than 3 kg 1 = do not know the amount of weight lost 2 = weight loss between 1 and 3 kg 3 = no weight loss or weight loss less than 1 kg	☐
C How would you describe your current mobility? [ENTER ONE NUMBER] *Please enter the most appropriate number (0, 1, or 2) in the box to the right.*	0 = unable to get out of a bed, a chair, or a wheelchair without the assistance of another person 1 = able to get out of bed or a chair, but unable to go out of my home 2 = able to leave my home	☐
D Have you been stressed or severely ill in the past 3 months? [ENTER ONE NUMBER] *Please enter the most appropriate number (0 or 2) in the box to the right.*	0 = yes 2 = no	☐
E Are you currently experiencing dementia and/or prolonged severe sadness? [ENTER ONE NUMBER] *Please enter the most appropriate number (0, 1, or 2) in the box to the right.*	0 = yes, severe dementia and/or prolonged severe sadness 1 = yes, mild dementia, but no prolonged severe sadness 2 = neither dementia nor prolonged severe sadness	☐
Please total all of the numbers you entered in the boxes for questions A-E and write the numbers here:		☐☐

Donini LM Validity of the self- mini nutritional assessment (Self- MNA) for the evaluation of nutritional risk. A cross- sectional study conducted in general practice; J of Nutrition ,Health & Aginging 2017.

MEAL Scale for Malnutrition in Chronic Wound Patients in Outpatient Wound Center

Multiple wounds

Do you have open wounds?

0 No

1 Yes

Eats< 3 meals

How many meals & snacks do you eat on a typical day?

0 ≥ 3 meals

1 ≤ 3 meals

Appetite loss

Thinking about your normal food intake, how would you say you are eating, about the same, more or less than usual?

0 About the same or more

1 Less than usual

MEAL Scale for Malnutrition in Chronic Wound Patients in Outpatient Wound Center

Level of Activity

Thinking about your normal level of activity, how would you consider your activity level over the past month?

0 Normal

0 Not quite normal but able to do most things

1 Not feeling up to most things, in bed or chair less than half the day

1 Able to do little activity & spend most of the day in bed or chair

1. Pretty much bedridden ,rarely out of bed.

Total Points

0-1 Not at risk

2-4 At risk

Fulton et al. Development of a nutrition screening tool for an out patient wound center, Advances2016;29(3):136-142

Wound Care Registry: Process Measure: Nutritional Screening & Intervention Plan in Patients with Chronic Wounds & Ulcers

DESCRIPTION: The % of patients aged 18 years and older with a diagnosis of a wound or ulcer of any type who undergo nutritional screening with a validated tool) within the 12 month reporting period, and for whom an appropriate nutritional intervention was ordered based on the results of the tool

CLINICAL RECOMMENDATION STATEMENTS:

Because adequate nutrition and hydration are critical to healing wounds of all etiologies, routine screening of patients with wounds is advisable

Consensus : Alliance of Wound care & 16 organizations

http://uswoundregistry.com/Files/Approved/nonMIPS_US%20Wound%20Registry%200020.pdf

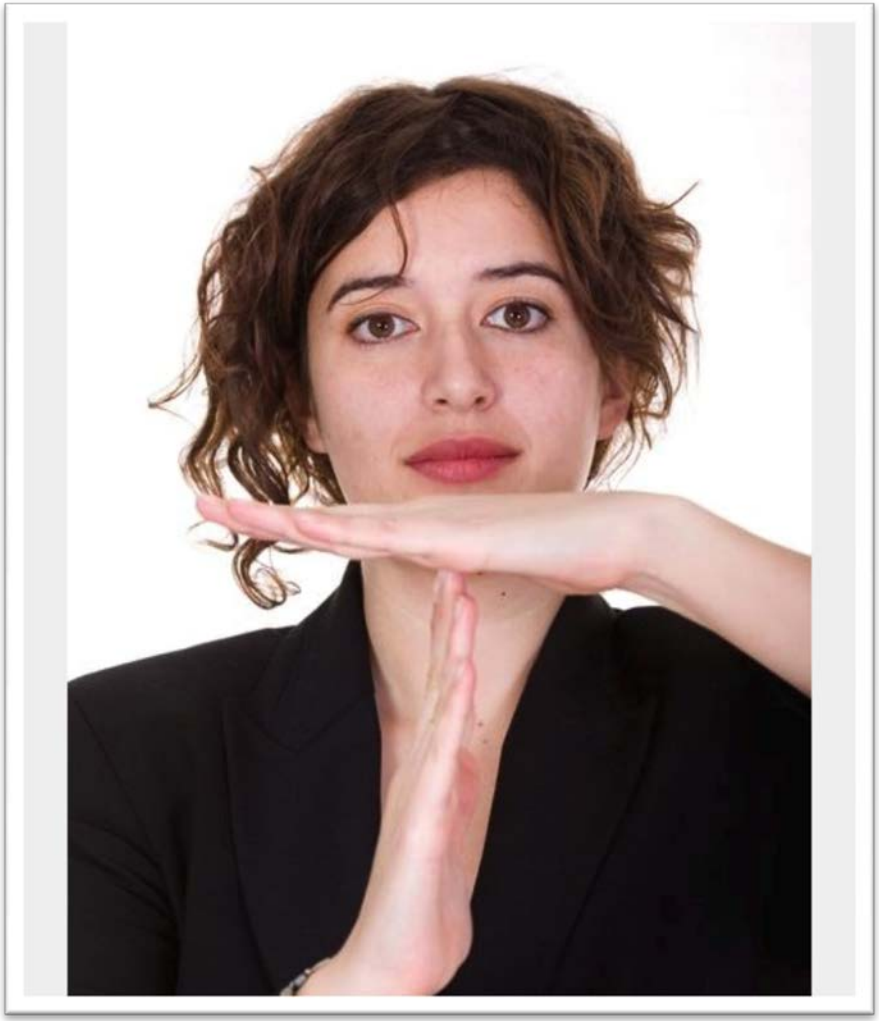
Guide for Management of Pressure Injuries: RDN trigger conditions

- Diagnosis/medical condition
- Skin condition per facility's wound assessment
- Review of skin assessment & validated nutrition screening tools
- Current dietary intake
- Determine weight status ,loss or gain
- Determine nutritional needs
- Medications/medical treatments
- Average food/ fluid intake, (% consumed)
- **Interview individual**
- Chewing/swallowing status/ability to eat independently
- Dehydration risk factors
- Nutrition related laboratory values: ie HgbA1C, BUN **Note: serum hepatic protein values are affected by infection, inflammation , hydration and renal function and do not reflect nutritional status**
- Renal and liver function for tolerance of protein
- Hydration status for elevated temperature, vomiting, profuse sweating or heavy draining wounds

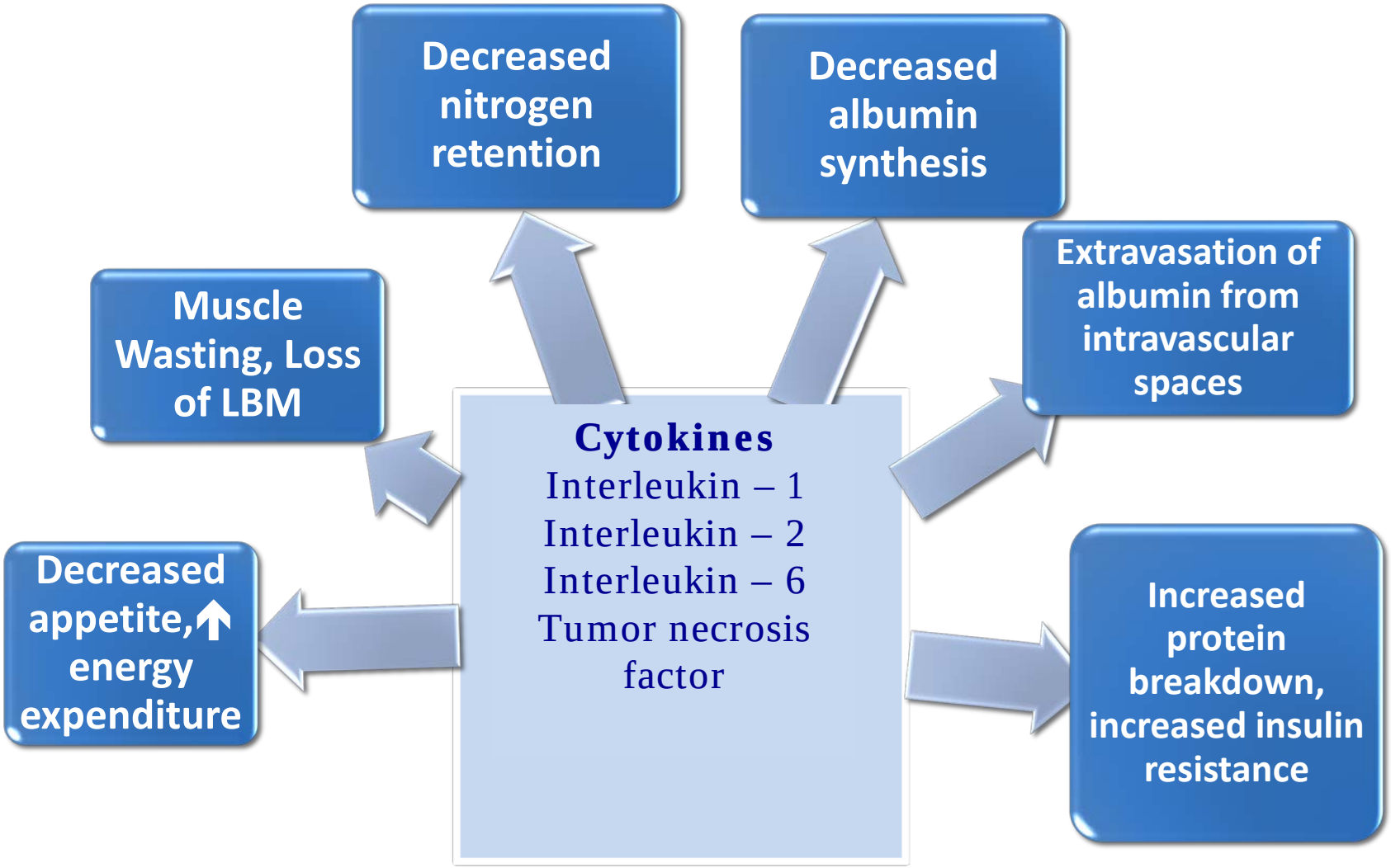
What about labs

No lab test can specifically determine an individual's nutritional status.

- Serum protein levels may be affected by metabolic stress, inflammation, renal function, hydration and other factors



Inflammation and Stress→ Release of Cytokines



Source: Council for Nutrition Clinical Strategies in LTC

Nutrition Assessment

1. Assess weight status for each individual to determine weight history and significant weight loss from usual body weight (≥5% change in 30 days or ≥10% in 180 days)**.**
SOE = C; SOR= Probably do it

2. Assess the individual's ability to eat independently.
SOE = C; SOR= Definitely do it

3. Assess the adequacy of total nutrient intake (food, fluid, oral supplements, enteral/parenteral feedings)**.**
SOE = C; SOR= Definitely do it

Plan of Care for PI Treatment

UWL of >5% in 30 days , eats less than 50% of 2gm. sodium diet, MNA screen 7 indicates malnutrition, Stage 3 PI on coccyx

Refer to registered dietitian to reassess, document , & implement revised treatment plan


CALORIE

What Does the Evidence Suggest?

Energy Intake

Responsive increase in metabolic rate which increases caloric needs (triggered by PI, infection, severe illness, trauma, etc.)

Energy is essential for pressure injury healing

Need to provide adequate calories to promote anabolism, nitrogen and collagen synthesis

Creda 2011, Yamamoto 2009

Energy Intake

1. Provide individualized energy intake based on underlying medical condition and level of activity. (SOE = **B**, Probably do it)
2. Provide 30 to 35 kcalories/kg body weight for adults with a pressure ulcer who are assessed as being at risk of malnutrition. (SOE = C, SOR= **Definitely do it**)
3. Adjust energy intake based on weight change or level of obesity. Adults who are underweight or who have had significant unintended weight loss may need additional energy intake. (SOE = C, SOR= **Definitely do it**

Energy Intake

4. Revise and modify/liberalize dietary restrictions when limitations result in decreased food and fluid intake. These adjustments should be made in consultation with a medical professional and managed by a registered dietitian whenever possible. (SOE = C, SOR= Probably do it)

5. Offer fortified foods and/or high calorie, high protein oral nutritional supplements between meals if nutritional requirements cannot be achieved by dietary intake. (SOE = **B**, SOR= **Definitely do it)**

Obese Individuals

- No evidence based guidelines available R/T the nutritional needs of the obese person with pressure injuries
- Adequate calories, protein, fluids & nutrients are needed for healing
  - General consensus- liberalize diet to promote healing
  - Consider Mifflin-St. Jeor formula to assess energy
  - Once the pressure injury is completely healed, caloric restrictions may be gradually implemented as needed
- Monitor skin integrity and coordinate with RDN (ongoing)

What Does the Evidence Suggest for Optimal Protein

- Increased protein linked to improved PI healing rates
- Provide adequate protein for positive nitrogen balance for an adult with a pressure ulcer. (SOE = **B,** SOR=Probably do it)

Protein Intake

- Offer 1.25 to 1.5 grams protein/kg body weight daily for adults with an existing pressure ulcer who is assessed to be at risk of malnutrition when compatible with goals of care, and reassess as condition changes. (SOE = C, SOR= Probably do it
- Offer high calorie, high protein nutritional supplements in addition to the usual diet to adults with nutritional risk and pressure ulcer risk, if nutritional requirements cannot be achieved by dietary intake. (SOE **A** = SOR= Probably do it)
- Assess renal function to ensure that high levels of protein are appropriate for the individual. (SOE = C, SOR= **Definitely do it)**

Ensure Adequate Protein

15%-38% of older men &
27%-41% of older women
eat less than the RDI for
protein.
(Morley et al. 2012)

Protein spread equally
between breakfast, lunch
and dinner
(Paddon-Jones 2009)

Alternate Food Sources of Protein

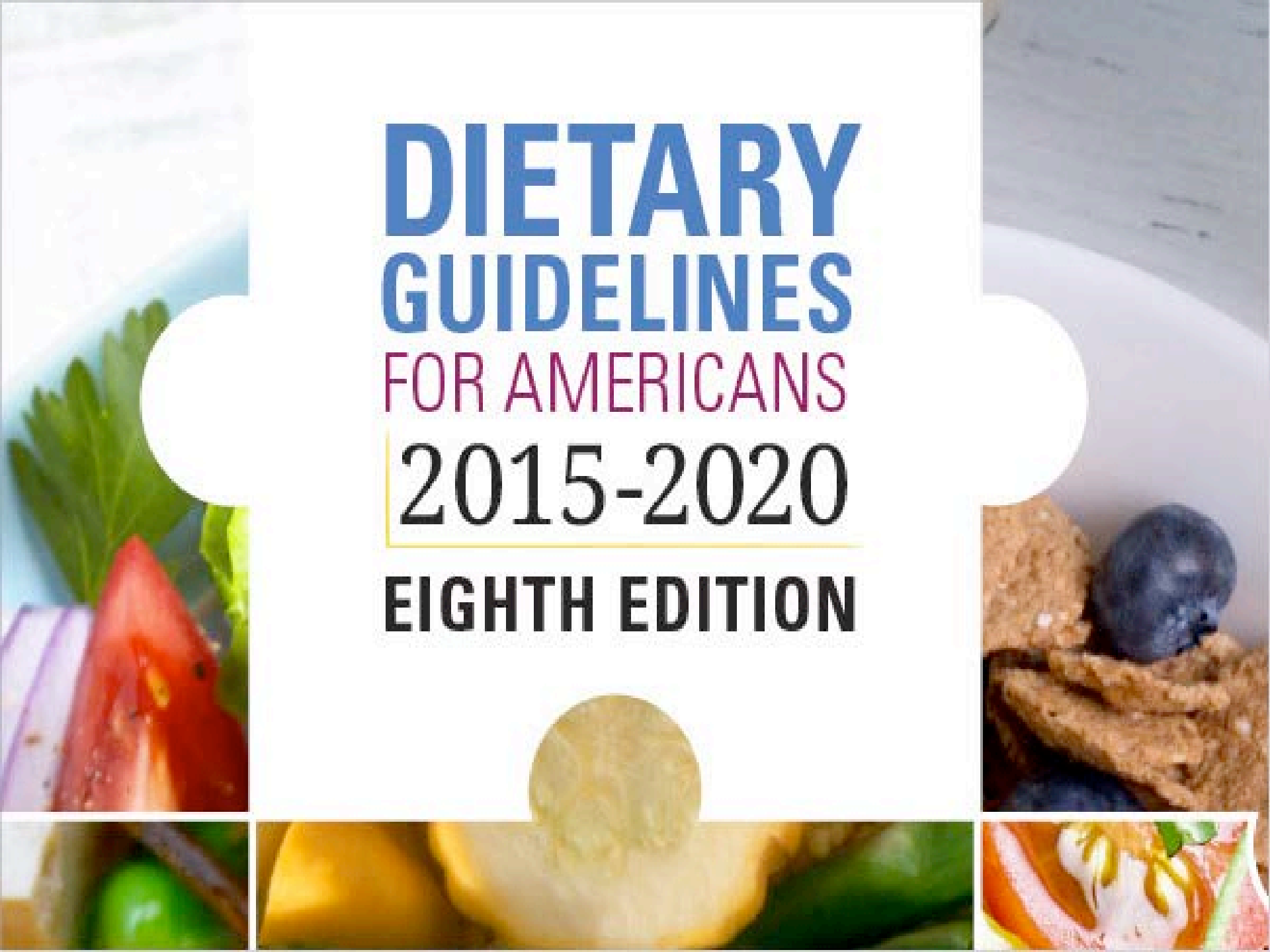
- 8 oz. Greek yogurt
  140 cal
- 14 gms pro

Micronutrients

Vitamins and Minerals

1. Provide/encourage an individual with a pressure ulcers to consume a balanced diet that includes good sources of vitamins and minerals. (SOE = **B**, SOR = **Definitely do it)**

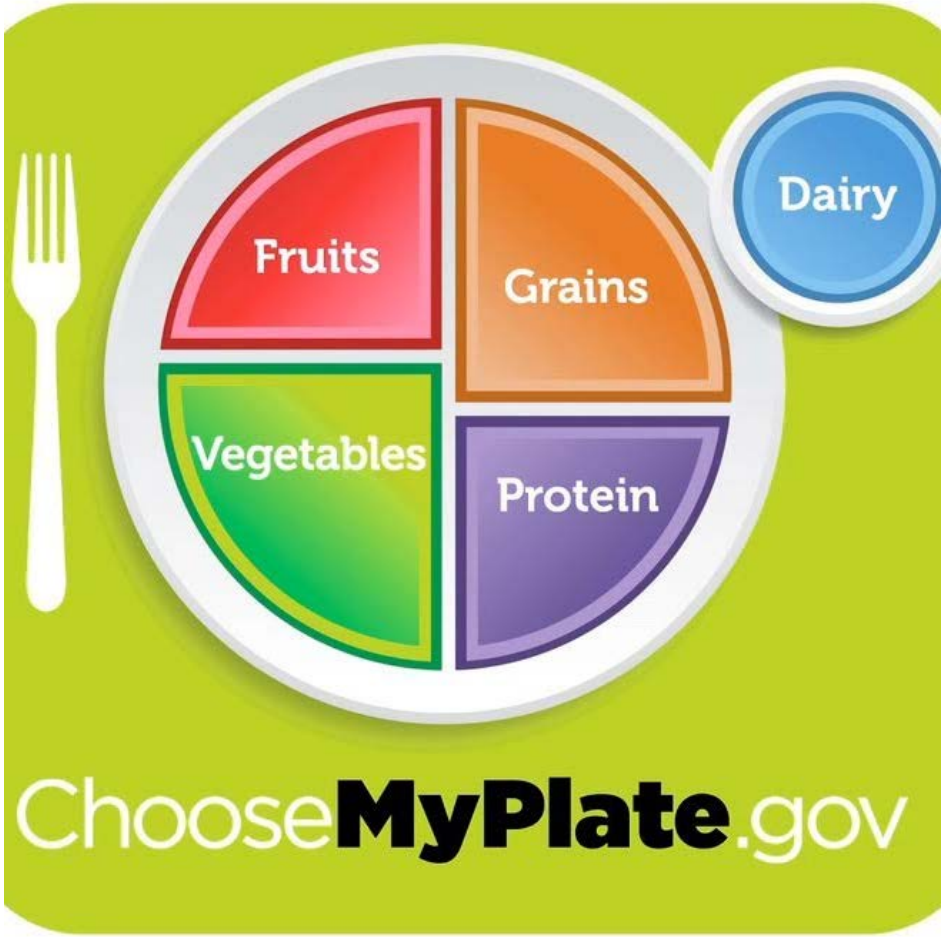
1. Provide/encourage an individual with a pressure ulcer to take vitamin and mineral supplements when dietary intake is poor or deficiencies are confirmed or suspected. (SOE = **B**, SOR= Probably do it)



DIETARY GUIDELINES FOR AMERICANS 2015-2020

EIGHTH EDITION

Key Recommendations



- Variety of vegetables, dark green, red & orange
- Fruits: whole fruits
- Protein: lean meat, fish, legumes, nuts, seeds
- Grain, focus-whole grains
- Dairy, yogurt, cheese, fortified soy
- Healthy fats, oils, olive, avocados,

Micronutrients

- Most nutrient needs can be met through a healthy diet
- Individuals with PIs may not be consuming an adequate diet
- No evidence to support vitamin C above the RDI unless a deficiency is diagnosed or suspected

Zinc

- No research to show zinc supplementation improves healing
- When clinical signs of zinc deficiency are present, zinc should be supplemented at ≤40 mg elemental zinc/day (UTL)
- Doses >40 mg/day can adversely affect copper status and possibly result in anemia

Plan of Care for PI Treatment

UWL of >5% in 30 days , current wt. 140 #, eats less than 50% of 2gm. sodium diet, MNA screen 7 indicates malnutrition, Stage 3 PU on coccyx

Refer to registered dietitian or nutrition team to reassess, document malnutrition & implement treatment plan

Re-assess, interview individual, assess calorie 30-35 Kcal/kg ABW, protein 1.25-1.5 g/kg ABW, fluid 1 mL/cal, modify diet to reg , recommend multivitamin/mineral supplement , offer high protein oral supplement between meals

Plan of Care for Chronic Non-healing PI

Slowing regaining wt., eats 75% of meals, 100% of supplement, stage 4 PI on coccyx & no progress toward healing plus draining wound

Refer to registered dietitian to reassess, document & revise treatment plan

Protein Intake

7. Supplement with high protein, arginine and micronutrients for individuals with a pressure ulcer Category/Stage III or IV or multiple pressure ulcers when nutritional requirements cannot be met with traditional high calorie and protein supplements.

(SO E = **B,** SOR= Probably do it)

CUBE Trial

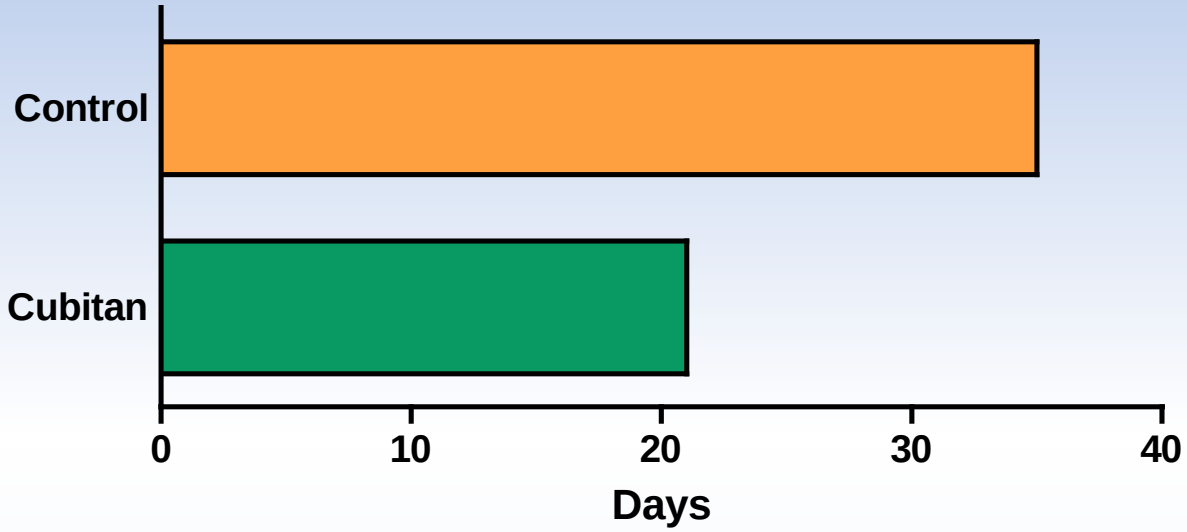
A multi-country, randomized, placebo-controlled trial to demonstrate the efficacy of a specific 'arg+ONS-spec.') on pressure ulcer healing in **non-malnourished patients with stage III-IV ulcers**

Ready-to-drink, high-protein, arginine enriched nutritional supplement

Containing per 200-ml serving:

- 20 g protein
- 3 g L-arginine
- 250 kcal
- Vitamins and micronutrients including:
  - 250 mg vitamin C
  - 38 mg vitamin E (α-TE)
  - 9 mg zinc
  - 1.5 mg carotenoids

Earlier Reduction in Ulcer Size from Baseline



With specific oral nutritional support a significant reduction in ulcer size was reached 2 weeks earlier compared to the control group.

- First time-point with a significant reduction compared to baseline
- Arg+ONS-spec.= day 21, P=0.011
- Control group = day 35, P= 0.019
- Means ± SEM; data adjusted for center

Oligo Element Trial Study Group

Study Group

- Multicenter, RCT to evaluate supplementation ⇧calorie, ⇧protein formula +arginine, zinc & antioxidants
- 200 malnourished patients with stage II,III,and IV PrUs
- 8 week trial – LTC and home care in Italy
- Majority of PrUs on sacrum

Malnutrition Criteria

- UWL – 5%(30 days) and 10% 3months
- BMI< 20 age <65 and < 21 > 65
- Food intake (<60% of estimated total daily energy requirements in the week before the study)
- Both groups received a 400 mL high-calorie, high-protein formula (100 Ml ,4x /day)
- Standard wound care for all

Nutrition Supplement

Intervention

- Protein 10 grams
- Arginine-L 1.5
- Zinc 4.5 mg
- Copper 675 mcg
- Vitamin C 125 mg
- Vitamin E 19.0 m

Standard: Control

- Protein 10 grams
- Arginine-0
- Zinc 2.3 mg.
- Copper 338 mcg
- Vitamin C 19mg
- Vitamin E 2.3 mg

Conclusion

- 69.9% in intervention formula group had 40% or greater reduction in PU size compared to 54.1% in control
- The efficacy of these nutrients in wound healing is likely synergistic because there is no evidence supporting an independent effect when given alone
- This nutritional intervention may be beneficial when added to optimized local wound care for the treatment of pressure ulcers in malnourished patients

Cereda E, Klersy C, Serioli M, Crespi A, D'Andrea F; for the OligoElement Sore Trial Study Group. A Nutritional Formula Enriched with Arginine, Zinc, and Antioxidants for the Healing of Pressure Ulcers: a Randomized, Controlled Trial.
Ann Intern Med 2015;162(3):167-17

What Does the Evidence suggest?

- Dehydration is a risk factor for pressure injury development
- Hydration needs must be met to assure proper prevention and healing

Hydration

1. Provide and encourage adequate daily fluid intake for hydration for an individual assessed to be at risk of or with a pressure ulcer. This must be consistent with the individual's comorbid conditions and goals. (SOE = C, SOR= **Definitely do it**

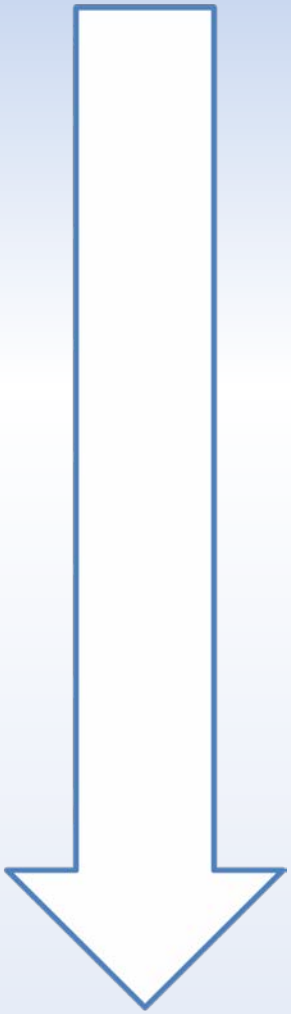
Hydration

2. Monitor individuals for S/S dehydration: changes in weight, skin turgor, urine output, elevated serum sodium and/or calculated
serum osmolality. (SOE = C, SOR= Probably do it)

3. Provide additional fluid for individuals with dehydration, elevated temp, vomiting, profuse sweating, diarrhea or heavily draining wounds. (SOE = C, SOR= **Definitely do it)**

Fluids

Needs increase according to insensible water loss



Needs may decrease for CHF, renal failure

Consider Taps

- Turn
- Align
- Position
- Sips

Provide Hydration

- Add variety of beverages
- Glass of water with meals
- Hydration pass & juice machines with resident access
- Hydration in rehab department

Plan of Care for Chronic Non-healing PI

Slowing regaining wt., eats 75% of meals, 100% of supplement, stage 4 PI on coccyx & no progress toward healing plus draining wound

Refer to registered dietitian to reassess, document & revise treatment plan

Interview individual, continue previous calorie & protein levels, ↑fluid offered between meals , discontinue multivitamin/mineral , offer high protein oral supplement fortified with arginine & micronutrients between meals

Plan of Care for Condition Change

Recent stroke & dysphagia, NPO status, wound healing per PUSH score,

Refer to registered dietitian or nutrition team to reassess, document & revise treatment plan

Nutrition Support

Consider nutritional support (enteral or parenteral nutrition) when oral intake is inadequate. This must be consistent with the individual's goals. (SOE = C, SOR= Probably do it)

Individuals have the right to request or refuse nutrition & hydration as medical treatment

Hydration with IVs does not supply nutrients

Plan of Care for Condition Change

Recent stroke & dysphagia, NPO status, wound healing per PUSH score,

Refer to registered dietitian or nutrition team to reassess, document & revise treatment plan

Re-assess, interview individual & caregivers ,enteral nutrition discussed & initiated, protein requirement not met with formula & modular protein added BID

Nutrient	Function	Recommendation
Calories	Energy source to preserve lean body mass	30-35 kca/kg BW & adjust per client, level of obesity
Protein	Tissue maintenance Collagen synthesis, build LBM	1.25- 1.5 g/kg BW adjust per condition, monitor renal status
Fluid	Normal cell function & tissue integrity	1 mL/kcal consumed, monitor hydration status
Vitamin C	Collagen synthesis ,supports formation of new blood vessels	Mega doses not recommended
Zinc	Protein synthesis; cellular growth; deficiency impairs healing	RDA 11mg/day males,8mg/day females, mega doses not recommended, UTL 40 mg/day
Arginine	Biological precursor to nitric oxid,increases blood flow which can support collagen in wounds	Supplemental arginine in high cal. high protein supplement with micronutrients maybe beneficial

Pressure Injury Care

Effective pressure injury treatment: multidisciplinary & holistic

Nursing Care
Turning regimes, hygiene, etc.

Support Surfaces
Mattresses, cushions, protection, etc.

Wound Care
Dressings, cleaning, drainage, etc.

Nutrition
Delivery of nutrients to stimulate healing

Guide for Management of Pressure Injuries

Implement PI Protocol/POC

Estimate Nutrient Needs:

- Calories: 30-35 kcalories/kg/body weight (adjust per clinical condition)
- Protein: 1.2-1.5 gms/kg/body weight (adjust per clinical condition)
- Fluid: 1 mL per day per kcalorie consumed, unless contraindicated & monitor hydration status
- Provide oral nutritional supplement with medication pass
- Offer preferred food/beverage at appropriate texture
- Liberalize restrictive diets
- Offer vitamin/mineral supplement with 100% of RDI's if intake is poor
- Weigh weekly or per facility policy

Monitor Per Facility Policy

Monitor:

- Skin condition and/or wound status weekly or per facility policy
- Acceptance and tolerance of oral supplement
- Caloric, protein, fluid adequacy compared to estimated requirement
- Ability to meet nutrient needs orally
- Weight status
- Laboratory values, if applicable
- Oral intake and if inadequate, consider enteral feeding consistent with individual's wishes

Desired Outcome

Outcomes:

- Intact skin or progress toward healing
- Improved and/or stable nutritional status
- Intake meets estimated caloric, protein and fluid requirements
- Effectiveness of intervention in collaboration with interdisciplinary team and adjust, if condition changes, improves or declines
- Document and re-assess per policy

Implement Facility MNT Protocol for Successful Nutrition Care

1

- Implement MNT protocol & use validated screening tool, refer to RDN to assess nutrition status
- Collaborate with interprofessioal team
- Individualize interventions and develop POC

2

- Provide diet based on estimated needs, consider fortified foods
- Offer supplements between meals if intake is inadequate
- Monitor POC and reassess as needed

3

- Consider ONS fortified with arginine, vitamin or minerals if needs not met with high calorie/protein supplement
- Consider EN/PN based on resident's wishes, when needs cannot be met orally

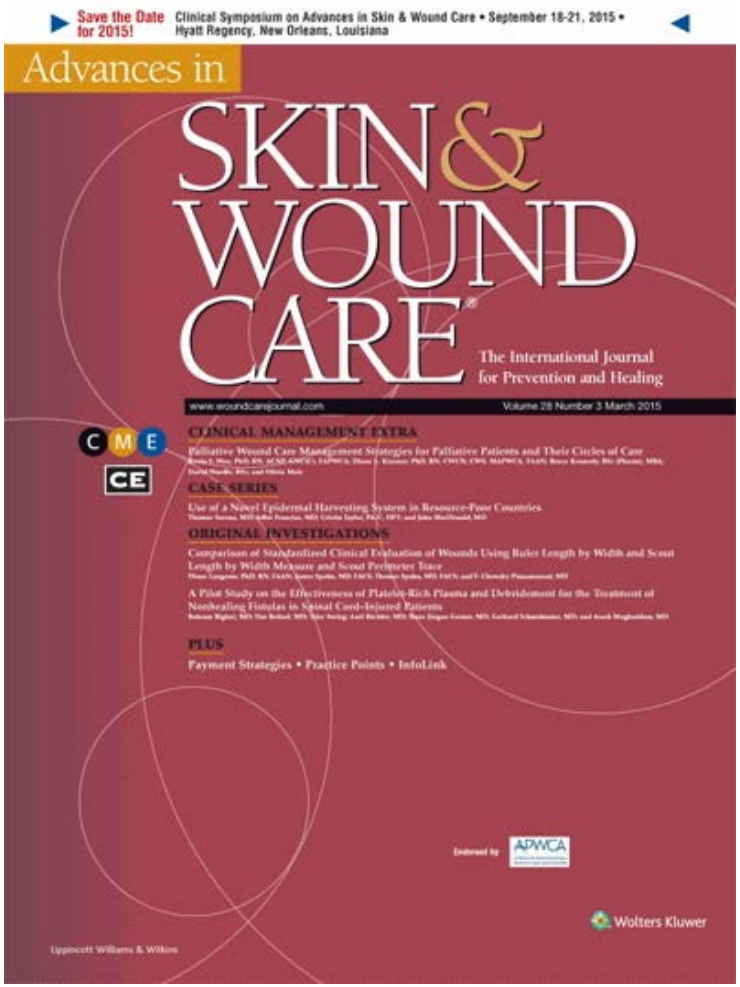
Questions

2015 Roberta Abruzzese Publishing Award

The Role of Nutrition for Pressure Ulcer Management: National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, and Pan Pacific Pressure Injury Alliance White Paper

- **Mary Ellen Posthauer, RDN, LD, CD, FAND** President, MEP Healthcare Dietary Services, Inc. Evansville, IN
- **Merrilyn Banks, PhD,** Director Nutrition and Dietetics, Royal Brisbane & Women's Hospital Herston, Queensland, Australia
- **Becky Dorner, RDN, LD, FAND**, President, Becky Dorner & Associates, Inc., and Nutrition Consulting Services, Inc., Naples, FL
- **Jos M.G.A. Schols, MD, PhD,** Professor of Old Age Medicine, Department of Family Medicine and Department of Health Services Research Maastricht University, Maastricht, The Netherlands

- March 2015



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