2014 NPUAP/ EPUAP/ PPPIA Guidelines

Feeding Your Wound: Fuel to Heal

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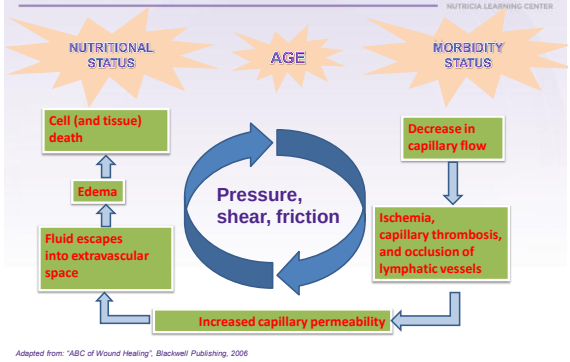
NLC NUTRICIA LEARNING CENTER

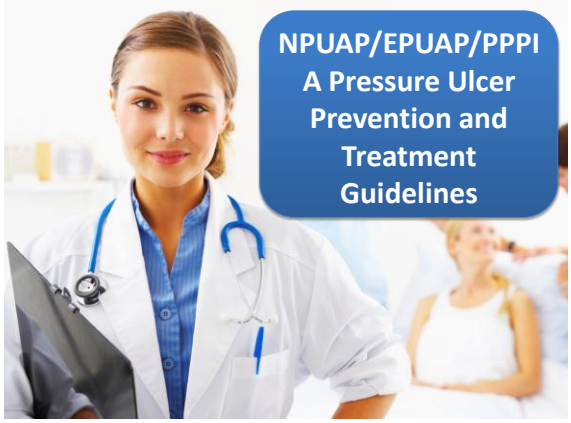
Objectives

1. Recognize the importance of screening and assessment to identify malnutrition and pressure ulcer 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. Discuss practical nutrition and hydration strategies for healing wounds

Pathogenesis of Pressure Ulcers



Adapted from: "ABC of Wound Healing", Blackwell Publishing, 2006



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

Goal of Guideline

- The goal of this international collaboration was to develop evidence-based recommendations for the prevention and treatment of pressure ulcers that could be used by health professionals throughout the world.
- Produced by the Guideline Development Group(GDG).
- Each section had a small work group (SWG) representatives from each organization.

Criteria

Inclusions

Study designs: Clinical controlled trials with a minimum of 10 subjects

Systematic reviews with Cochrane methodology meta-analyses

Qualitative studies as appropriate to the topic

Exclusions

Animal studies (unless other not available)

Studies of chronic wounds - unless sub-group of ≥10 subjects with Pressure Ulcers was analyzed separately

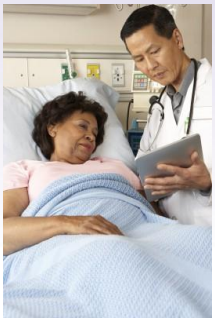
Level of Evidence Rating to Support Recommendation

- A – Direct scientific evidence from properly designed and implemented controlled trials on PrU in humans (or humans at risk of PrUs), providing statistical results that consistently support the recommendation (level 1 studies/clear cut evidence)
- B –Direct scientific evidence from properly designed and implemented clinical series on PrU in humans (or humans at risk of PrUs)providing statistical results that consistently support the recommendation
- C – Indirect evidence (e.g., healthy humans, animal models and/or other types of chronic wounds and/or expert opinion)

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

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 & 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

Definitions: Adult Malnutrition

- "Malnutrition is most simply defined as any nutritional imbalance." (Dorland 2011)
- Undernutrition: lack of calories, protein or other nutrients needed for tissue maintenance and repair.
- Undernutrition and malnutrition used interchangeably.

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

Diagnosing Malnutrition:

2009 Academy Workgroup (with ASPEN reps.)

Identification of ≥2 of the following characteristics:

1. Insufficient energy intake
2. Weight loss
3. Loss of muscle mass
4. Loss of subcutaneous fat
5. Localized or generalized fluid accumulation that may sometimes mask weight loss
6. Diminished functional status as measured by hand grip strength (strong research; cost effective)

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

Definitions: Adult Malnutrition

Non-severe — **Malnutrition Continuum** — Severe

- Adult undernutrition: continuum of inadequate intake and/or increased requirements, impaired absorption, altered transport, and altered nutrient utilization.
- Weight loss can occur at multiple points along this continuum.
- May also have inflammatory, hypermetabolic, and/or hypercatabolic conditions.

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

Malnutrition & Pressure Ulcers

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)

Nutrition Screening, Assessment, and Care Planning

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. (Strength of Evidence = C, Strength of Recommendation -SOR = probably do it)

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Nutrition Screening

2. Use a valid and reliable nutrition screening tool to determine nutritional risk. (Strength of Evidence = 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. (Strength of Evidence = C; SOR=probably do it.)

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Nutrition Screening Tool

Quick and Easy → **Acceptable** → **Validated**

Validated Screening Tools

MST Malnutrition Valid and reliable for use in ***acute care and ambulatory care*** to identify malnutrition (Ferguson, M et al. Nutrition1999 15:458-464.)

MNA Mini-Nutritional Assessment
Validated in ***individuals with PUs***
Validated and easy to use in ***older adults***
(Poulia, KA, 2012)
www.mna-elderly.com/

MUST Malnutrition Universal Screening Tool
To identify risk of undernutrition (BAPEN, 2008) Validated for use in ***older adults admitted to acute care***
http://www.bapen.org.uk/must_tool.html

SNAQ Short Nutrition Assessment Questionnaire
Acute care, residential care and community adults ≥65.
http://www.fightmalnutrition.eu/fight-malnutrition/screening-tools/snaq-tools-in-english/

Malnutrition Screening Tool (MST)

Step 1:
Have you recently lost weight without trying?
If yes, how much have you lost?
Have you been eating poorly because of a decreased appetite?
Step 2: Score to determine risk
Step 3: Intervene with nutritional support for those at risk of malnutrition

http://static.abbottnutrition.com/cms-prod/abbottnutrition.com/img/Malnutrition%20Screening%20Tool_FINAL.pdf

Mini Nutritional Assessment®

MNA®

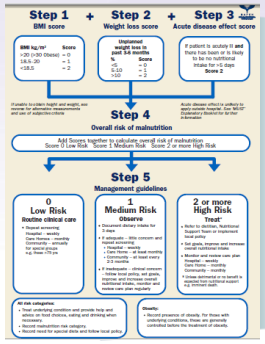
Validated and easy to use in geriatric patients

Acute care, hospital based ambulatory care, LTC

http://www.mna-elderly.com

21

Malnutrition Universal Screening Tool



MUST

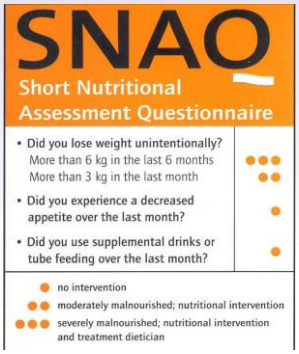
To identify risk of undernutrition
(BAPEN, 2008)

BMI
Weight loss past 3-4 months
Acute disease (no intake >5 days)

http://www.bapen.org.uk/must_tool.html

22

Short Nutritional Assessment Questionnaire



Braden Scale: Nutrition Subscores

Sensory Perception	1 Completely limited	2 Very limited	3 Slightly limited	4 No impairment
Moisture	1 Constantly moist	2 Very moist	3 Occasionally moist	4 No impairment
Activity	1 Bedfast	2 Chair		
Mobility	1 Completely immobile	2 Very limited	Slightly limited	No limitation
Nutrition	**1 Very poor**	**2 Probably inadequate**	**3 Adequate**	**4 Excellent**
Friction & Shear	1 Problem	2 Potential problem	3 No apparent problem	

Refer to RDN

©1988 Barbara Braden and Nancy Bergstrom

Comprehensive Nutrition Assessment

Academy's Nutrition Care Process

Nutrition:

1. Assessment
2. Diagnosis
3. Intervention
4. Monitoring and Evaluation

Purchase the NCPT online at NCP@webauthor.com

Focus of Nutritional Assessment

- Evaluation of:
  - Energy intake
  - Unintended weight change (insidious weight loss, obese individuals also at risk)
  - Effect of psychological stress or neuropsychological problems
- Include a determination of the individual's caloric, protein and fluid requirements.

Every Pound Counts Counts

Loss of Weight	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%

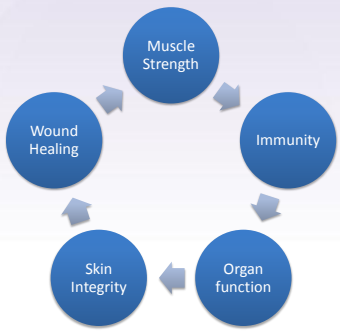
Demling, RH., 2009

Significant UWL (from UBW)

Unintended weight loss creates lean body mass loss

Obese individuals are also at risk

Lean Body Mass is Essential for:



Loss of Muscle and Recovery

A pre-existing deficiency of muscle mass before trauma coupled with acute loss of muscle mass and function makes recovery of normal function unlikely.

Kortebein P, et al. *JAMA* 2007; 297:1772-4.

Dietary Intake

- Depression affects appetite of 30% of adult outpatients.
- Loss of appetite related to high risk of malnutrition.
- Increases risk of poor wound healing.
- Decreased ability to eat independently.

↓

Risk for undernutrition and delayed healing.

Horn 2004; Gilmore 1995

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.

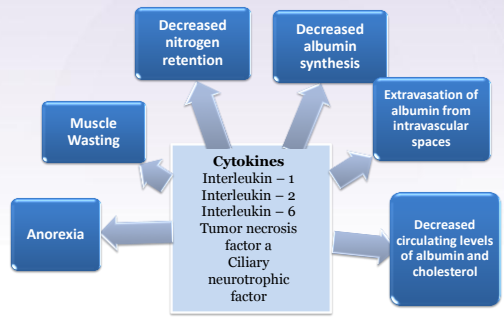
What about labs for diagnoses of malnutrition?

Not recommending any specific inflammatory markers for diagnosis at this time.

Inflammatory biomarkers, C-reactive protein and other positive acute phase reactants were excluded – **no conclusive relationship to nutritional status**

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

Inflammation and Stress→ Release of Cytokines



Source: Council for Nutrition Clinical Strategies in LTC

Laboratory Parameters-Inflammation

Decreased

- serum albumin
- serum transferrin
- serum prealbumin
- platelet count
- *OR* increased white blood cell count

Increased

- C-reactive protein (↓'d in liver failure)
- blood glucose
- percentage of neutrophils in the CBC
- Marked negative nitrogen balance

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**

Care Planning

1. Develop an individualized nutrition care plan for individuals with or at risk of a pressure ulcer. (SOE = C, SOR= Probably do it)

1. Follow relevant and evidence-based guidelines on nutrition and hydration for individuals who exhibit nutritional risk and who are at risk of pressure ulcers or have an existing pressure ulcer. (SOE=C, SOR= Probably do it)

Interprofessional Team

Allen 2013- quasi-experimental study on effects of comprehensive interprofessional nutrition protocol

General Recommendation: Nutrition Intervention for Pressure Ulcers

General Recommendations

Use your clinical judgment based on a thorough medical and nutritional assessment to make appropriate *individualized* recommendations

Individualized care plan should focus on:

- improving and/or maintaining overall nutritional status
- acceptance of nutrition interventions
- clinical outcomes

What Does the Evidence Suggest?

Energy Intake

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

Energy is essential for pressure ulcer 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 at risk of a pressure ulcer who are assessed as being at risk of malnutrition. (SOE = C, SOR= Probably do it)

3. 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**)

Energy Intake

4. 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)**

5. 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)

Energy Intake

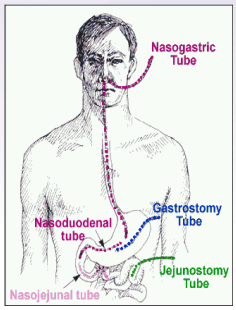
6. Offer fortified foods and/or high calorie, high protein oral nutritional supplements between meals if nutritional requirements cannot be achieved by dietary intake. (SOE = B, SOR= **Definitely do it)**

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

Nutrition Support

- NPO >3-5 days
- Hydration with IVs does not supply nutrients
- Places individual at risk of undernutrition and pressure ulcer development

Enteral Feedings



Determine if patient ***actually*** receives TF as prescribed:

- Is TF given as ordered (product, mLs/hr)?
- Are flushes given as ordered (flushes, flushes with meds)?
- Is the strength correct?
- Is the individual tolerating the feeding?
- Round the clock or intermittent (turned off)?

Protein

What does the Evidence Suggest for PUs?

All stages require adequate protein

Increased protein levels have been linked to improved healing rates (Lee 2006, Breslow 1993)

Inadequate Protein:
prolongs inflammatory state
inhibits antibody responses
↓collagen synthesis & deposition
↓ cell multiplication
↓wound contraction

Ensure Adequate Protein Intake

15%-38% of older men eat less than the RDI for protein.

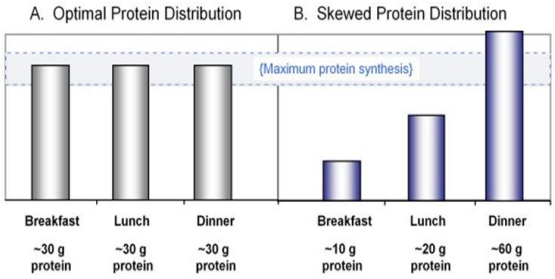
27%-41% of older women eat less than the RDI for protein.

Morley J et. al. Nutritional recommendations for the management of sarcopenia *J Am Med Dir* 2010;11:391-396.

What Does the Evidence Suggest for Optimal Protein Intake for Older Adults

- Positive association between protein ingestion and muscle mass *(PORT-AGE study group JAMDA 2013)*
- Protein spread equally between breakfast lunch and dinner *(Paddon-Jones 2009)*
- If needed, additional protein supplementation should given between meals *(Wilson MM 2002)*

Protein Distribution



Protein Intake

1. Provide adequate protein for positive nitrogen balance for adults assessed to be at risk of a pressure ulcer. (SOE = C, SOR= Probably do it)

2. Offer 1.25 to 1.5 grams protein/kg body weight daily for an adult at risk of a pressure ulcer who is assessed to be at risk of malnutrition when compatible with goals of care, and reassess as condition changes. (Strength of Evidence = C), SOR =Probably do it

3. Provide adequate protein for positive nitrogen balance for an adult with a pressure ulcer. (Strength of Evidence = B, Probably do it)

Protein Intake

4. 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)

5. 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)

Protein Intake

6. Assess renal function to ensure that high levels of protein are appropriate for the individual. (SOE = C, SOR= **Definitely do it)**
   - Clinical judgment is required to determine the appropriate level of protein for each individual, based on the number of pressure ulcers present, overall nutritional status, co-morbidities, and tolerance to nutritional interventions.

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)

Evidence on Amino Acids

Arginine

Conditionally indispensible during acute stress

Stimulates collagen synthesis

Contributes to nitric oxide & ⇧blood flow

May have some immune stimulating effects

Several recent studies demonstrate promising results

Key maybe synergistic combination of protein, key vitamins, minerals

Nutrition plus good nursing care and treatment

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

Patient Inclusion

Patients

- Between 18 yrs and 90 yrs
- Stage III or IV pressure ulcers (EPUAP & NPUAP grading)
- BMI ≥18.5 (18-70 yrs) or BMI ≥21 (>70 yrs)
- Nursing home or hospital based

Total group (ITT)	
Age*	74.9 ± 14.6 y
BMI*	24.4 ± 4.8 kg/m²
Ulcer stage III/IV	31/12 (72/28%)
Pressure ulcer size* (ellipse)	10.5 ± 11.5 cm²
PUSH tool score*	11.5 ± 3.1

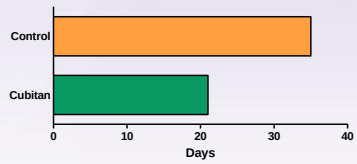
No significant differences between groups at baseline
* means ± SD

Set-up

43 patients in intention-to-treat analysis (ITT)

-Intervention ('arg+ONS-spec.') group: 22 patients
-Control (placebo) group: 21 patients
-Product use: 3x200 ml/day; max. 8 weeks
-Standard diets and pressure ulcer care were maintained

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

59

Oligo Element Trial Study Group

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

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

Malnourished 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. RDN calculated energy needs.
- Both groups received a 400 mL high-calorie, high-protein formula (100 Ml ,4x /day)
- Standard wound care for all

Nutritional Supplement in 100mL

Intervention	Standard: Control
• Protein 10 grams	• Protein 10 grams
• Arginine-L 1.5	• Arginine-0
• Zinc 4.5 mg	• Zinc 2.3 mg.
• Copper 675 mcg	• Copper 338 mcg
• Vitamin C 125 mg	• Vitamin C 19mg
• Vitamin E 19.0 mg	• 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.

Fluids: What Does the Evidence Suggest?

Dehydration is a risk factor for pressure ulcer 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)**

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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)**

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Fluids

Needs increase according to insensible water loss

Needs may decrease for CHF, renal failure

Methods of Calculating Fluid Needs

1 mL/calorie consumed

30 mL/kg BW/day

In generally healthy individuals that are adequately hydrated, food accounts for >20% of total fluid intake. (DRI 2004)

Total fluid needs include water content of food.

What does the Evidence Suggest?

Micronutrients

Micronutrients

Most nutrient needs can be met through a healthy diet

However, individuals with pressure ulcers may not be consuming an adequate diet to meet established nutritional reference standards

Vitamins and Minerals

1. Provide/encourage individuals assessed to be at risk of pressure ulcers to consume a balanced diet that includes good sources of vitamins and minerals. (SOE = C, SOR = **Definitely do it)**
2. Provide/encourage an individual assessed to be at risk of a pressure ulcer to take vitamin ad mineral supplements when dietary intake is poor or deficiencies are confirmed or suspected. (SOE = C, SOR= Probably do it
3. 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)**
4. 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)

Vitamin C

- Involved in the synthesis of collagen
- Acts on fibroblast proliferation and cellular immunity

There is no evidence to support vitamin C above the RDI unless a deficiency is diagnosed or suspected.

Zinc

Zinc: contributes to protein & DNA synthesis; immune function & cellular proliferation

Zinc requirements can be met by 2 servings/ day of animal protein.

A multivitamin/mineral supplement daily (15 mg zinc) may be adequate.
(DRI 2004)

Zinc

No research has demonstrated an effect of zinc supplementation on improved pressure ulcer 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.
- High serum zinc levels may inhibit healing.
  (Thomas 1997, Reed 1985, Dimant 1999, Goode 1992)

Obesity and Pressure Ulcers

75

Obese Individuals

- There are no evidence based guidelines available related to the nutritional needs of the obese person with pressure ulcers
- Adequate calories, protein, fluids and nutrients are needed for healing
  - General consensus is that diets should be liberalized to promote healing
  - Once the PrU is completely healed, diet restrictions may be gradually implemented as needed
- Monitor skin integrity and coordinate with RDN (ongoing)

Medical Food Supplement

- Foods that are specially formulated & processed for the resident who is seriously ill or who requires the product as a major treatment modality
- Criteria:
  - for oral or tube feeding
  - labeled for the dietary management of a specific medical disorder, disease, or condition for which there are distinctive nutritional requirements
  - intended to be used under medical supervision

http://www.cfsan.fda.gov/~dms/medfguid.html

Oral Nutritional Supplements

- Significantly fewer hospital readmissions with high pro ONS.
- Significant improvement in handgrip strength with use of high protein ONS (also increase total dietary intake and improves body weight).
- ONS use is associated with decreased length of stay, episode cost, and 30-day readmission risk. (ROI of $2.56 net savings due to averted 30-day readmissions for every dollar spent on ONS in the matched sample.)

Cawood AL, Elia M, Stratton RJ. Systematic review and meta-analysis of the effects of high protein oral nutritional supplements. Ageing Research Reviews, Volume 11, Issue 2, April 2012, Pages 278–296. Accessed 8/22/13 at http://www.sciencedirect.com/science/article/pii/S1568163711000900.
Jensen GL. Oral nutritional supplementation. *Am J Manag Care.* 2013:19:119-120. Accessed 8-22-13 http://www.ajmc.com/publications/issue/2013/2013-1-vol19-n2/Oral-Nutritional-Supplementation.

Steps to Successful Nutrition Care

1. Screen and Assess Nutrition Status
   - Individualize interventions and develop POC
2. Provide diet based on estimated needs, consider fortified foods
   - Offer supplements between meals if intake is inadequate
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

Pressure Ulcer Care

Effective pressure ulcer treatment: multidisciplinary & holistic

Nursing Care	Support Surfaces	Wound Care	Nutrition
Turning regimes, hygiene, etc.	Mattresses, cushions, protection, etc.	Dressings, cleaning, drainage, etc.	Delivery of nutrients to stimulate healing

We cannot simply give a patient with PU or at risk of developing PU a new and healthy skin!

April: 2015

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

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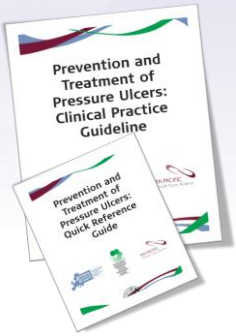
- **Jos M.G.A. Schols, MD, PhD,** Professor of Old Age Medicine, Department of Family Medicine and Department of Health Services Research Maastricht University, Maastricht, The Netherlands

Advances in Skin and Wound Care – The International Journal for Prevention and Healing

New 2014 NPUAP-EPUAP and Pan Pacific Injury Alliance Guidelines



- ***Quick Reference Guide***: summary of the recommendations and excerpts of the supporting evidence for pressure ulcer prevention and treatment. Intended as a quick reference.
- ***Clinical Practice Guideline***: comprehensive version of the guideline, a detailed analysis and discussion of available research, critical evaluations and description of the methodology used to develop guideline.
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Questions?

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References

- Grey JE, Enoch S, Harding KG. Wound assessment. *Bmj*. 2006;332(7536):285-8.
- Poulia KA, Yannakoulia M, Karageorgou D, et al. Evaluation of the efficacy of six nutritional screening tools to predict malnutrition in the elderly. *Clin Nutr.* 2012;31(3):378-85.
- Neelemaat F, Kruizenga HM, de Vet HC, et al. Screening malnutrition in hospital outpatients. Can the SNAQ malnutrition screening tool also be applied to this population? *Clin Nutr.* 2008;27(3):439-46.
- Langkamp-Henken B, Hudgens J, Stechmiller JK, et al. Mini nutritional assessment and screening scores are associated with nutritional indicators in elderly people with pressure ulcers. *J Am Diet Assoc.* 2005;105(10):1590-6.
- Ferguson M, Capra S, Bauer J, et al. Development of a valid and reliable malnutrition screening tool for adult acute hospital patients. *Nutrition*. 1999;15(6):458-64.
- Demling RH. Nutrition, anabolism, and the wound healing process: an overview. *Eplasty.* 2009;9:e9.
- Kortebein P, Ferrando A, Lombeida J, et al. Effect of 10 days of bed rest on skeletal muscle in healthy older adults. *Jama.* 2007;297(16):1772-4.
- English KL, Paddon-Jones D. Protecting muscle mass and function in older adults during bed rest. *Curr Opin Clin Nutr Metab Care.* 2010;13(1):34-9.

References

- Horn SD, Bender SA, Ferguson ML, et al. The National Pressure Ulcer Long-Term Care Study: pressure ulcer development in long-term care residents. *J Am Geriatr Soc.* 2004;52(3):359-67.
- Gilmore SA, Robinson G, Posthauer ME, et al. Clinical indicators associated with unintentional weight loss and pressure ulcers in elderly residents of nursing facilities. *J Am Diet Assoc.* 1995;95(9):984-92.
- Allen B. Effects of a comprehensive nutritional program on pressure ulcer healing, length of hospital stay, and charges to patients. *Clin Nurs Res.* 2013;22(2):186-205.
- Lee SK, Posthauer ME, Dorner B, et al. Pressure ulcer healing with a concentrated, fortified, collagen protein hydrolysate supplement: a randomized controlled trial. *Adv Skin Wound Care.* 2006;19(2):92-6.
- Ohura T, Nakajo T, Okada S, et al. Evaluation of effects of nutrition intervention on healing of pressure ulcers and nutritional states (randomized controlled trial). *Wound Repair Regen.* 2011;19(3):330-6.
- Paddon-Jones D, Rasmussen BB. Dietary protein recommendations and the prevention of sarcopenia. *Curr Opin Clin Nutr Metab Care.* 2009;12(1):86-90.
- Wilson MM, Purushothaman R, Morley JE. Effect of liquid dietary supplements on energy intake in the elderly. *Am J Clin Nutr.* 2002;75(5):944-7.
- Morley JE, Argiles JM, Evans WJ, et al. Nutritional recommendations for the management of sarcopenia. *J Am Med Dir Assoc.* 2010;11(6):391-6.

References

- Banks, M., J. Bauer, N. Graves, et al. (2010). "Malnutrition and pressure ulcer risk in adults in Australian health care facilities." Nutrition in Clinical Practice 26(9):896-901. Evi
- Evidence -Based Recommendations for optimal dietary protein intake in older people: A Position Paper from the PORT-AGE study group *JAMDA 2013; 14(8):542-559.*
- **2014 National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline. Emily Haesler (Ed.). Cambridge Media: Osborne Park, Western Australia.**
- Position of the American Dietetic Association: Individualized Nutrition Approaches for Older Adults in Health Care Communities. *J Am Diet Assoc. 2010;110: 1549-1553.*
- Fry, D.E., M. Pine, B.L. Jones, et al. (2010). "Patient characteristics and the occurrence of never events." Archives of Surgery 145(2):148-51.
- White J, et.al. Consensus Statement of the Academy of Nutrition and Dietetics/American Society of Parenteral and Enteral Nutrition: characteristics recommended for the identification and documentation of Adult Malnutrition(Undernutrition) *J Acad Nutr Diet* 2012:112:730-738http://malnutrition.andjrnl.org/Content/articles/1-Consensus_Statement.pdf

References

- Edsberg, Langemo,Baharestani, Posthauer,Goldberg. Unavoidable pressure injury state of the science consensus conference. JWOCN. 2014;July: 313-334.
- van Anholt, R., L. Sobotka, E. Meijer, et al. (2010). "Specific nutritional support accelerates pressure ulcer healing and reduces wound care intensity in non-malnourished patients." Nutrition **26**(9):867-72
- 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
- "DOMINATE Wounds," *Wounds* 2014; 26(1):1-12 .
- Maillet,OSJ, Schwartz DB,Posthauer ME. Position of the Academy of Nutrition and Dietetics: ethical and legal issue of feeding and hydration. J Acad Nutr Diet. 2013;113:828-833.