Evidence-Based Nutrition for Wound Healing and Malnutrition-Part 1: Nutrition Approaches for Wound Care Webinar

Live Webinar: March 12, 2025 (1:30-2:30 pm ET) Convert to your own time zone

Professional Approvals

Becky Dorner & Associates has been a trusted provider of high quality continuing professional education since 1993 (Commission on Dietetic Registration provider number NU004).

Live Webinar: Evidence-Based Nutrition for Wound Healing and Malnutrition - Part 1: Nutrition Approaches for Wound Care awards 1.25 CPEUs in accordance with the Commission on Dietetic Registration CPEU Prior Approval.

Recorded/Enduring Webinar: Evidence-Based Nutrition for Wound Healing and Malnutrition - Part 1: Nutrition Approaches for Wound Care awards 1.25 CPEUs in accordance with the Commission on Dietetic Registration CPEU Prior Approval.

Intended Audience: RDNs and NDTRs	**CPEUs**	**CDR Level**	**CDR Activity Type**	**CDR Activity Number**	**Expiration Date**
Live Webinar	1.25	2	186639	172	1/21/26
Recorded/Enduring	1.25	2	186640	741	1/21/28
Suggested CDR Performance Indicators: 5.1.2, 7.8.1, 11.3.2 **Note: Numerous Other Performance Indicators May Apply.**					

Funding has been provided through an independent medical educational grant from Abbott Nutrition.

How to Complete this Program and Receive Your Certificate

Carefully review the contents of this program. Keep in mind the practical applications it has for you in your individual setting. The focus is to increase your knowledge and application of the subject matter.

You must complete this program prior to the expiration date. To obtain your certificate, review the materials, take and pass the online test, and complete the evaluation. For multiple choice questions select the one best answer from the choices given. You may retake the online test as many times as needed prior to the expiration date. If you are interrupted and cannot finish the test, you can save it and come back later to finish it. Also see the last slide in this handout for more information.

If you wish, you may submit evaluations of the quality of this course activities/materials to CDR at qualityCPE@eatright.org. *You can also visit* https://www.beckydorner.com/continuing-education/how-to-complete-cpe/.

Questions? Please contact us at info@beckydorner.com

Evidence-Based Nutrition for Wound Healing and Malnutrition Care
Part I: Nutrition Approaches for Wound Care Webinar

Today's Webinar

Program Length
- 60 minutes

Handouts
- Live: Emailed to the person who registered for the program, and posted in the Go To Webinar System
- Recording: Available on our website with the recording

Questions
- Live: Use GoToWebinar to ask questions
- Recording: Email info@beckydorner.com

Credit Hours/Certificate
- Please refer to handouts for details

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Disclosures

- Funding from non-CPE revenue for CPE planning, development, review, and / or presentation has been provided by Abbott Nutrition.

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Disclosures
Dr. Litchford discloses that she is a consultant for Prosynthesis Labs, Abbott Nutrition and Nestle Nutrition, however, she has confirmed no conflict of interest exists for this program.

Dr. Mary Litchford, PhD, RDN, LDN

- Internationally recognized speaker, author, and consultant to healthcare organizations
- Background in clinical practice, university research and teaching, and business consulting
- President of CASE Software & Books, a professional and educational resource company
- Past President of the NPIAP
- Honors include the
  - 2024 Distinguished Lecture Award, Academy of Nutrition & Dietetics
  - 2021 JoAnn Maklebust Lifetime Achievement Award, NPIAP
  - 2018 Award of Excellence in Consultation & Business Practice, Academy of Nutrition & Dietetics

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Dr. Nancy Munoz, DCN, MHA, RDN, FAND

- U Mass Amherst, Lecturer
- Rosalind Franklin University of Medicine and Science, Adjunct Professor
- VA Southern Nevada Healthcare System, Chief of NFS
- Recognized speaker and author
- Honors include the Academy Medallion Award
- Has served numerous organizations, including the NPIAP, DHCC, HA, and the Academy Positions Committee

Disclosures
Dr. Munoz confirms that no conflicts of interest exists for this program.

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Evidence-Based Nutrition for Wound Healing and Malnutrition Part I: Nutrition Approaches for Wound Care

Mary Litchford, PhD, RDN, LD
Nancy Munoz, DCN, MHA, RDN, FAND

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Objectives

After completing this continuing education course, the learner should be able to:

1. Understand the impact of malnutrition on the risk for wound development and treatment.
2. Recognize the association between nutrients, disease process and malnutrition.
3. Determine appropriate nutrition interventions to optimize nutrition recovery.

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Global Health Nutrition

Good News & Bad News from Global Burden of Disease Study

Good News…

- Healthier diets could save one in five lives every year
- Diet is a modifiable risk factor!

Bad News…

- Poor diets were responsible for 10.9 million deaths annually
- Diet related illness represents about 16 years of disability-adjusted life years
  - Cardiovascular disease
  - Diabetes
  - Cancers
- Poor diet is an equal opportunity killer
  - High sodium intake
  - Low intake whole grains, fruits and vegetables
- No region of the world meets the recommendations for whole grains, fruits and vegetables.

GBD 2017 Diet Collaborators. Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*. 3 April 2019

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Aging…Illness…Risk for Wounds: Is There a Connection?

Homeostasis

- Biological systems maintain internal equilibrium when external changes occur.
- Muscle synthesis greater than muscle breakdown.
- Physically active lifestyle associated with more muscle mass.
- Skin is generally resilient.
- Injuries heal quickly when pressure is relieved and nutrient needs are met.

Homeostasis + Malnutrition

- Rate of muscle synthesis reduced & breakdown increases.
- Higher risk for micronutrient insufficiencies or deficiencies.
- Skin is less resilient to trauma or pressure.
- Injuries, wounds heal at a slower rate.
- Risk for infection is greater in malnourished client.

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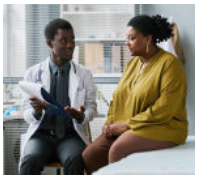
Aging…Illness…Risk for Wounds: Is There a Connection?

Allostasis

- Biological systems maintain stability through change.
- Diet and inflammatory conditions are stressors.
- Balance of muscle synthesis and breakdown is shifting towards breakdown.
- Skin is less resilient, risk for wounds is somewhat higher and wounds heal more slowly.



Allostasis + Malnutrition

- Low quality diets and inflammatory stress negatively impact internal equilibrium.
- Balance of muscle synthesis and breakdown significantly shifts towards breakdown especially in sedentary adults.
- Higher risk for micronutrient deficiencies.
- Skin is more susceptible to injury from trauma or pressure.
- Injuries, wounds heal at a slower rate

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Aging…Illness…Risk for Wounds: Is There a Connection?

Homestenosis
- Reduction of physiological reserve capacity
- More energy and protein needed to maintain the status quo.
- Muscle breakdown exceeds muscle synthesis.
- Skin integrity is less tolerant to changes in environment, pressure, trauma.

Homestenosis + Malnutrition
- Physiological reserve capacity exceeded.
- Higher macro and micronutrient needs.
- Muscle breakdown exceeds muscle synthesis due to insufficient reserves, anabolic resistance, inactivity, inflammatory stress, and diet.
- Skin has low tolerance to changes in external pressure and trauma.
- Wounds heal slowly, become chronic, become infected or worsen.

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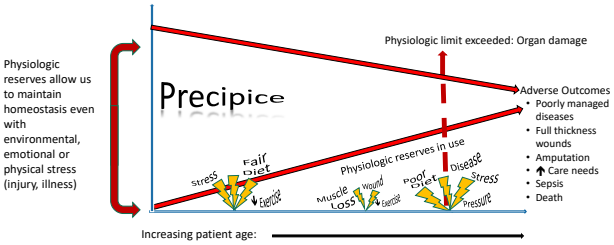
Homeostasis vs Allostasis vs Homeostenosis



Tatlet, G. "Physiology of aging." In *Geriatric Medicine: A Person Centered Evidence Based Approach*. Cham: Springer International Publishing, 2024. 1555-1565.

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Protein Metabolism

Body Processes/Recycles ~ 250-350 g protein/day: 1/3 from diet, 2/3 from reserves

Dietary Protein

Amino Acids

Old, Damaged Protein & Protein Reserves

Dispensable amino acids
muscle protein synthesis (MPS)
body maintenance & repair
other nitrogen containing body components

All protein drawn from reserves needs to replenish reserves.
All old and damaged protein needs to be replaced

Sufficient protein + exercise = ↑ MPS, optimal body maintenance & repair

Insufficient protein + immobility + inflammation = ↑ MPB, body maintenance & repair

Waterlow JC. 1984. Protein turnover with special reference to man. *Quart J Exp Physiol* 69:409–438; Reeds PJ. Garlick P.J. 1984. Nutrition and protein turnover in man. *Adv Nutr Res* 6:93–138; IOM. DRI for Energy, Carbohydrate Fiber, Fat, Fatty Acids, Cholesterol, Protein and Amino Acids. 2005. NAP.

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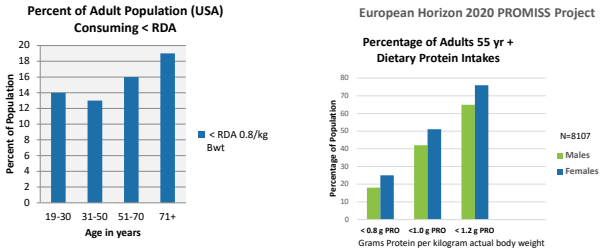
Protein Intakes in USA vs. Europe



Berryman, C et al. Protein intake trends and conformity with the DRI in the USA : analysis of the NHANES, 2001–2014, *AJCN*, 2018.108(2), 405–413. https://doi.org/10.1093/ajcn/nqy088
Hengeveld,L et al. Prevalence of protein intake below recommended in community-dwelling older adults: a meta-analysis across cohorts from the PROMISS consortium. *Journal of Cachexia, Sarcopenia and Muscle*, 2020. DOI: 10.1002/jcsm.12580

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Daily Protein Turnover Rate from Reserves

Body Processes/Recycles ~ 300 g protein/day or ~3%

Free amino acids
~ 70 g

Synthesis ~ 300 g/day

Degradation ~ 300 g/day

Whole-body protein
~10 kg

Muscle (100 g/day)	~ 2% turnover rate
Liver (80 g/day)	~ 25% turnover rate
Intestines (60 g/day)	~ 20% turnover rate
Kidney (30 g/day)	~30% turnover rate
Skin & other organs (30 g/day)	~ 15% turnover rate
Total	300 g/d

Kang,M. Muscle Protein Metabolism in Critical Illness. Surg Metab Nutr. 2020;11:35-39. https://doi.org/10.18858/smn.2020.11.2.35

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Body Protein Turnover and Quality

Aging & Inactivity

Exercise

Ubiquitin Proteasome System

Amino Acids

MPS
MPB
Normal Protein +
MPB
Misfolded or damaged proteins

Amino Acids

MPS

Fewer Misfolded or damaged proteins

Malfunction
Normal Function

Nishimura, Y et al. Am J Phy-Cell Phy 2021 321:2, C276-C287

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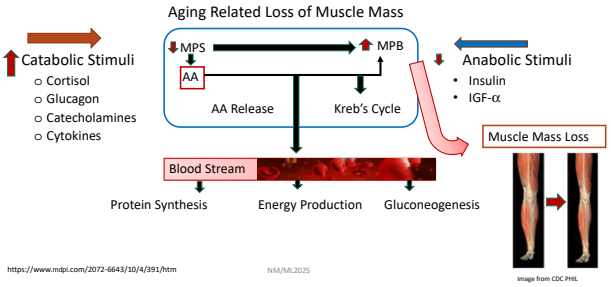
Pathogenesis of Protein Disarrangement in Aging



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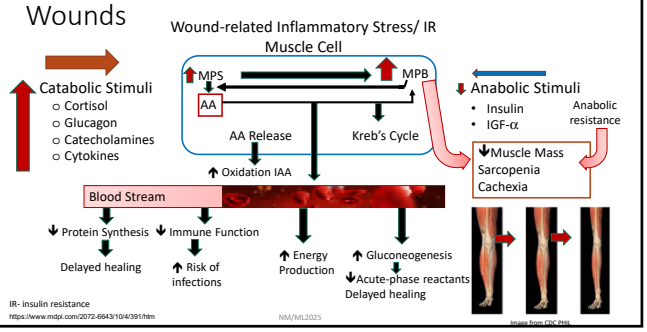
Pathogenesis of Protein Disarrangement in Wounds



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Poll 1

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In **acute illness**, where is the most protein drawn from reserves?

A. No specific region
B. Skeletal muscles (arms and legs)
C. Visceral organs

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Poll 2

In **chronic illness**, where is the most protein drawn from reserves?

A. No specific region
B. Skeletal muscles (arms and legs)
C. Visceral organs

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Effects of Impaired Protein Utilization in Older Adults

Impaired Protein Utilization

Cardiovascular System
- ↓ ventricular contractility
- ↓ stroke volume & cardiac output
- ↑ arrythmias
- ↑ cardiac dysfunction
- ↓ Blood flow to wound

Respiratory System
- ↓ respiratory muscle efficiency
- ↓ lung defenses
- ↑ pulmonary edema
- ↑ respiratory failure
- ↑ Resting metabolism → higher energy needs

Musculoskeletal System
- ↓ muscle mass → lower energy needs
- ↓ contractile and endocrine-metabolic function
- ↑ Risk for chewing/ swallowing difficulties, & constipation due to
- ↓ muscle mass

Immune System
- ↓ Circulating T-cells, Helper T cells & suppressor cells
- ↓ Secretory IgA
- ↑ Infections → ↑↑ inflammatory stress
- ↑ Risk wound infections

Electrolytes & water
- Positive Na balance
- ↑ Na/K
- ↑ Total exchangeable Na
- ↓ Total exchangeable K
- ↑ Edema

Negative Impact on Wound Healing and Worse Clinical Outcomes

https://www.mdpi.com/2072-6643/10/4/391/htm
Nishimura, Y et al. Am J Phy-Cell Phy 2021 321:2, C276-C287

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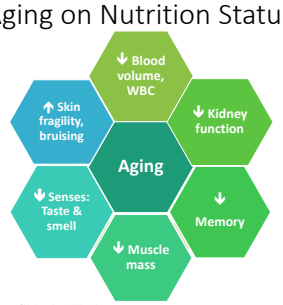
Impact of Aging on Nutrition Status



Demarest-Litchford, M et al The Impact of Malnutrition on Skin Integrity and Wound Healing. *Advances in Skin & Wound Care*, 2024. 37(3), 126-135.
Nishimura, Y et al. Am J Phy-Cell Phy 2021 321:2, C276-C287

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Global Health Nutrition

Good News & Bad News: Burden of Micronutrient Deficiencies in Adults

Good News…

- Few deficiencies reported than in 1999-2019 report than in 1990-1998 report.
- Highest prevalence of micronutrient deficiencies is reported in low resource countries.

Han X., *et al.* Global, regional, and national burdens of common micronutrient deficiencies from 1990 to 2019: A secondary trend analysis based on the Global Burden of Disease 2019 study. *EClinMed* 2022;44:101299
Mangal DK, *et al.* Burden of micronutrient deficiency among patients with type 2 diabetes: systematic review and meta-analysis. *BMJ Nutrition, Prevention & Health.* 2025;0:e000950. doi:10.1136/ bmjnph-2024-000950

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Global Health Nutrition

Good News & Bad News: Burden of Micronutrient Deficiencies in Adults

Bad News…

- Micronutrient deficiencies are important contributors to the global burden of disease as contributors to increased rates of morbidity and mortality.
- Globally, ~ 1/3 of people suffer from at least one micronutrient deficiency.
- Micronutrient deficiencies can impact energy metabolism, protein synthesis, glucose metabolism and insulin signaling pathways.
- Common nutrient deficiencies reported in Global Burden of Micronutrient Deficiencies: Vitamin A, iron, iodine, folate, zinc
- Common Nutrient Deficiencies in Adults with Type 2 diabetes: Vitamin D, Vitamin B12, Magnesium

Han X., *et al.* Global, regional, and national burdens of common micronutrient deficiencies from 1990 to 2019: A secondary trend analysis based on the Global Burden of Disease 2019 study. *EClinMed* 2022;44:101299
Mangal DK, *et al.* Burden of micronutrient deficiency among patients with type 2 diabetes: systematic review and meta-analysis. *BMJ Nutrition, Prevention & Health.* 2025;0:e000950. doi:10.1136/ bmjnph-2024-000950

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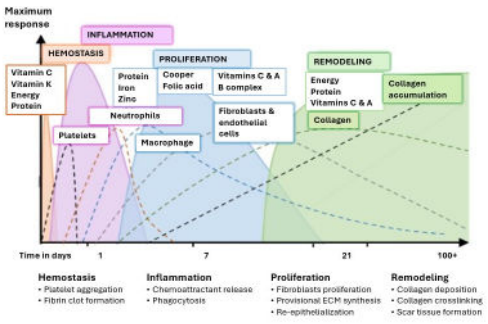
Nutrients by Phase of Wound Healing



Arribas-López E. The Effect of Amino Acids on Wound Healing: A Systematic Review and Meta-Analysis on Arginine and Glutamine. Nutrients. 2021 Jul 22;13(8):2498. doi: 10.3390/nu13082498

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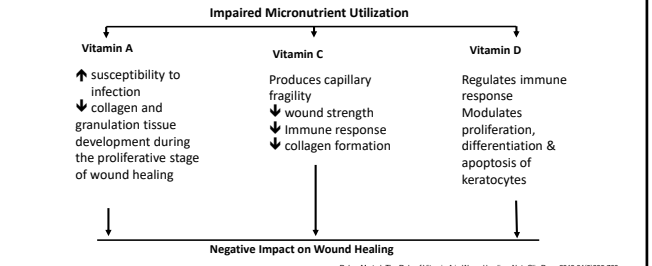
Effects of Impaired Micronutrient Utilization in Older Adults at Risk for Wounds



Wright JA, et al. The role of iron in the skin and cutaneous wound healing. Front Pharmacol. 2014 Jul 10;5:156.
Zinder R et al. Vitamin A & Wound Healing. Nutr Clin Prac. 2019.34(6)839-849.
Polcz, M et al. The Role of Vitamin A in Wound healing. Nutr Clin Prac. 2019.34(5)695-700.
Bechara N, et al. A Systematic Review on the Role of Vitamin C in Tissue Healing. *Antioxidants*. 2022; 11(8):1605.
Siregar, F. D., & Hidayat, W. The Role of Vitamin D on the Wound Healing Process: A Case Series. *International Medical Case Reports Journal*, (2023). *16*, 227–232.

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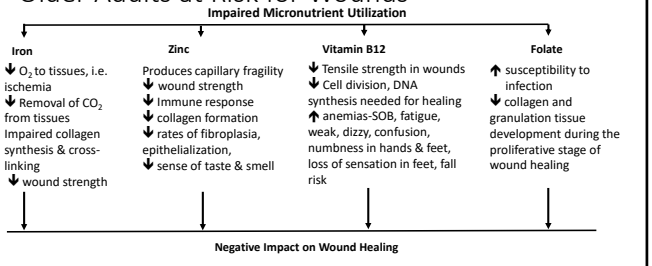
Effects of Impaired Micronutrient Utilization in Older Adults at Risk for Wounds



Wright JA, et al. The role of iron in the skin and cutaneous wound healing. Front Pharmacol. 2014 Jul 10;5:156.
Badedi, M. et al. Vitamin B$_{12}$ Deficiency and Foot Ulcers in Type 2 Diabetes Mellitus: A Case–Control Study. *Diabetes, Metabolic Syndrome and Obesity*.2019. *12*, 2589–2596.
Development Initiatives; Bristol, UK: 2020. Global Nutrition Report: Action on equity to end malnutrition. globalnutritionreport.org/reports/2020-global-nutrition-report/
Lin PH, Zinc in wound healing modulation. Nutrients. 2017 Dec 24;10(1):16.
Boykin Jr JV. High-dose folic acid and its effect on early stage diabetic foot ulcer wound healing. Wound Repair and Regeneration. 2020 Jul;28(4):517-25.

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Clinical Pearls

- Poor diet is an equal opportunity killer.
- Protein utilization is impacted by inflammation, illness and aging.
- Impaired protein utilization has negative effects on multiple organ systems - including skin.
- Common micronutrient deficiencies reported in adults impacts skin health and wound healing.
- Use precision focused nutrition care to assess adults at risk of or with malnutrition.
- Use precision focused nutrition wound care to assess adults at risk of or with pressure injuries and chronic wounds.

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Nutrition Interventions

Good Practices and Recommendations

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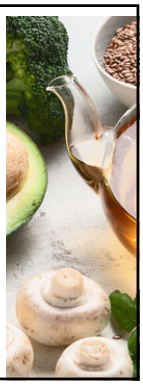

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Nutrition Interventions

- Conduct nutrition screen
  - Individuals admitted to a healthcare setting
- Comprehensive nutrition assessment
  - Performed by RDN
  - For individuals screened at nutritional risk
  - Individuals at risk for developing wounds
- Evaluate oral intake
  - 24-hour dietary recall
  - Food diaries
  - Food log (calorie counts)
- Encourage individuals to consume a nutrient-dense diet

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.

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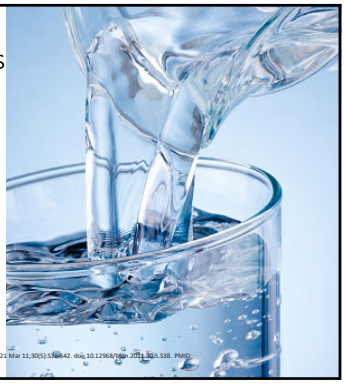
Nutrition Interventions

- Promote Adequate hydration
  - Water from food and metabolism accounts for 20% or more of total fluid intake
  - Fluid needs
    - 30 mL/kg body weight
    - 1mL/Kcal/day
- Fluid needs are increased with
  - Diarrhea
  - Vomiting
  - Profuse sweating
  - Elevated temperature
  - Copious wound drainage
  - High protein diet



Reference: Ghaly P, Iliopoulos J, Ahmad M. The role of nutrition in wound healing: an overview. Br J Nurs. 2021 Mar 11;30(5):S36-S42. doi: 10.12968/bjon.2021.30.5.S38. PMID: 33733851

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Nutrition Interventions

- Increase oral intake
  - Nutritional counseling
    - Personalized dietary prescription
    - Sample meal plans/recipes
    - Personal eating patterns adapted to personal preferences
      - Taking cultural and religious preferences into account
  - Liberalize therapeutic restrictions
  - Provide mealtime assistance to facilitate optimal nutritional intake
  - Fortified Foods

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.

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Poll 3

True or False

In post-acute care, Centers for Medicare & Medicaid Services (CMS) mandates that menu developers gather residents' input on religion, culture, and ethnicity.

- True
- False

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Nutrition Interventions

- Oral Nutritional Supplements
  - Malnutrition in Older Adult Nutrition Practice Guideline from the Academy of Nutrition and Dietetics (2024)
    - Healthcare practitioners should recommend ONS for older adults with malnutrition or at risk of malnutrition living in long-term care.
    - ONS intake 1-2 times per day is likely to increase calorie and protein intake, promote weight maintenance or weight gain, and improve nutrition status
  - Systematic review Impact of nutritional supplement on chronic wound healing (Soares do Espiritu Santo, 2024)
    - ONS supplementation enhances the healing process of chronic wounds
  - Evidence for recommending specific blends for those undergoing elective/scheduled surgeries
    - ERAS protocols

Reference: 1. Prevention and Treatment of Malnutrition in Older Adults Living in Long-Term Care or the Community: An Evidence-Based Nutrition Practice Guideline. Riddle, Emily et al. Journal of the Academy of Nutrition and Dietetics, Volume 124, Issue 7, 896 - 916.e24 2. Impact of oral nutritional supplement composition on the healing of different chronic wounds: A systematic review https://www.sciencedirect.com/science/article/abs/pii/S0899900724000996

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Nutrition Interventions

- Consider the individual's nutritional intake when evaluating ONS needs
  - Use ONS to fill the gap between intake and nutritional needs
- Provide nutritional supplements between meals or as requested by the patient (on demand)
- Use nutrient-dense product
  - 1.5 to 2.4 kcal/mL
- Consider flavor preference, temperature, and variety
- Provide for at least 4 weeks

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.

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Nutrition Interventions

- Protein supplementation
  - Taking protein supplementation might be associated with a lower rate of PI occurrence
  - Follow reputable nutrition guidelines relevant to the individual's clinical and demographic profile to determine appropriate protein intake

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.

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Nutrition Interventions

Recommendations & Good Practice Statements (GPS) International Guideline, 2025	Other Evidence-Based Guidelines ESPEN Guideline on nutritional support for polymorbid internal medicine patients ESPEN Guidelines for Micronutrient deficiencies PROT-AGE ESPEN Guidelines for Clinical Nutrition and Hydration in Geriatrics
Protein supplementation is for people at risk of pressure injuries who have been identified as malnourished or at risk of malnutrition. (Conditional recommendation, very low certainty of evidence) • For older adults with acute or chronic health conditions, supplement protein at a rate of 1.2 to 1.5 g/kg body weight/day is suggested • For critically ill adults or adults with severe injury, protein supplementation at a rate of 1.3 to 2.0 g/kg body weight/day is suggested	R 2: Protein intake in older persons should be at least 1g protein/kg body weight/d.The amount should be individually adjusted with regard to nutritional status, physical activity level, disease status, and tolerance. Grade B Strong consensus 100% agreement R 5.1: Polymorbid medical inpatients requiring nutritional support shall receive a minimum of 1.0 g of protein/kg of body weight per day in order to prevent body weight loss, reduce the risk of complications and hospital readmission, and improve functional outcomes. Grade A strong consensus 95% agreement R 7.1: In polymorbid medical inpatients with pressure ulcers, specific amino-acids (arginine and glutamine) and β-hydroxy-β-methylbutyrate (βHMB) can be added to oral/enteral feeds to accelerate the healing of pressure ulcers. Grade 0 consensus 90 % agreement

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.

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Nutrition Interventions

- Energy
  - Determine energy needs for individuals at risk of or with malnutrition using indirect calorimetry, if available
  - Adjust energy intake based on weight change, degree of obesity, and client's medical diagnoses
  - Individuals with low BMIs may require more energy
  - Individuals with a BMI of 30 or more need to be evaluated for appropriate intake to promote wound healing

Munoz N, Litchford M. Nutritional Aspects of Wound Care. Clin Geriatr Med. 2024 Aug;40(3):481-500. doi: 10.1016/j.cger.2023.12.005. Epub 2024 Jan 16. PMID: 38960539.

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2025 International Guideline

Nutrition Recommendations

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GRADE System

2025 International Pressure Injury/Ulcer Guideline

RESEARCH TO PRACTICE

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THE GRADE process

1. PICO question and search
2. Identify and appraise evidence
3. Meta-analysis and certainty of evidence
4. Evidence-to-decision framework
5. Recommendation and strength
6. Good practice statements
7. Implementation considerations

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.

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Evaluation of Best Evidence

1. PICO question and search

What is the impact of
an Intervention
on an Outcome measure
compared to a Comparator intervention
in a defined Population?

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.

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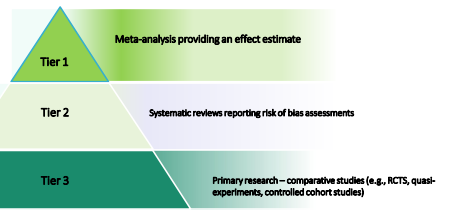
Evaluating the Evidence

2. Identify and appraise evidence



Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.

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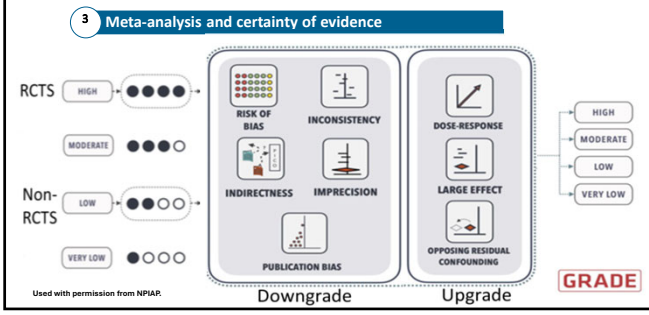
Evaluation of Best Evidence



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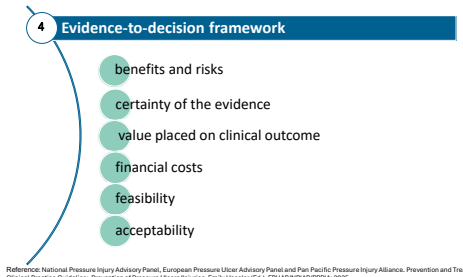
Evaluating the Evidence



Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.

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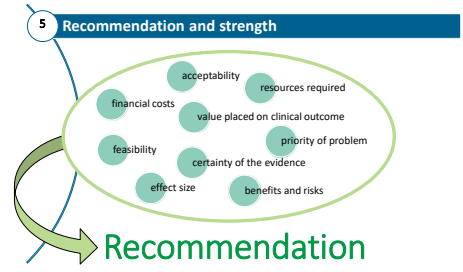
Evaluation of Best Evidence



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Evaluation of Best Evidence

5 Recommendation and strength

Recommendation

- Strong recommendation FOR the intervention
- Conditional recommendation FOR the intervention
- Conditional recommendation AGAINST the intervention
- Strong recommendation AGAINST the intervention
- No specific recommendation

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.
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Evaluating the Evidence

6 Good practice statements

7 Implementation considerations

Purpose:
- Enhance the evidence-based recommendations
- Guidance on topics that cannot be explored in a comparative study design
- Provide tips and tricks to help implement the recommendations

Evidence base:
Observational and implementation studies, expert opinion, consumer opinion

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.
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Nutrition in Pressure Injury Prevention

- Nutrition Screening
  - It is good practice to conduct nutrition screening for individuals at risk of a pressure injury. (**Good practice statement**)
  - It is good practice to conduct a comprehensive nutrition assessment for individuals at risk of a pressure injury who are screened to have a risk of malnutrition. Use the findings to develop an individualized nutrition care plan. (**Good practice statement**)

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.
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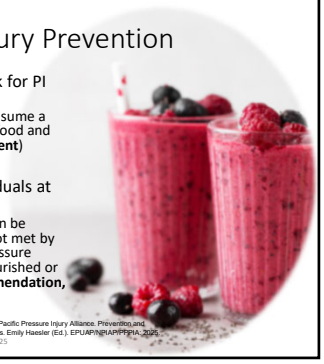
Nutrition in Pressure Injury Prevention



- Diet and nutrition for individuals at risk for PI
  - It is good practice to provide and encourage individuals at risk of a pressure injury to consume a balanced diet that includes nutrient-dense food and adequate hydration. (**Good practice statement**)
- Nutritional supplementation for individuals at risk for PI
  - We suggest that nutritional supplementation be implemented when nutritional needs are not met by usual dietary intake for people at risk of pressure injuries who have been identified as malnourished or at risk of malnutrition. (**Conditional recommendation, very low certainty of evidence**)

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.
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Nutrition in Pressure Injury Prevention

- Protein supplementation
  - We suggest implementing protein supplementation for people at risk of pressure injuries who have been identified as malnourished or at risk of malnutrition. (Conditional recommendation, very low certainty of evidence)
- Energy, protein, and micronutrients
  - We suggest that carbohydrate-based energy, protein and micronutrient supplementation not be used routinely for the specific purpose of preventing pressure injuries in individuals at risk of malnutrition and at pressure injury risk. (Conditional recommendation, very low certainty of evidence)
  - It is good practice to consider energy and targeted micronutrient supplementation for some sub-populations at pressure injury risk (e.g., individuals who are diagnosed with malnutrition, underweight, have significant unintended weight loss, with critical medical conditions or who have identified vitamin/mineral deficiencies), in addition to supplementation that meets their protein needs. (Good practice statement)

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.
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Nutrition in Pressure Injury Prevention

- Enteral Feeding
  - We recommend against tube feeding for the specific purpose of preventing pressure injuries in individuals with or at risk of malnutrition and at pressure injury risk. (**Strong recommendation, very low certainty of evidence**)
  - It is good practice to make every reasonable effort to maintain and promote oral nutrition. When oral intake is inadequate, providers should not presume that there is an imperative to implement tube feeding; any decision should be preceded by a comprehensive, multidisciplinary assessment of goals of care, benefits, risks, and preferences related to the individual. (Good practice statement)

Reference: National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline: Prevention of Pressure Ulcers/Injuries. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2025.
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Code to Care

Navigating Malnutrition and Maximizing Reimbursement

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Malnutrition Coding and Reimbursement

- Hospitals are allowed to bill for the treatment of malnutrition
  - Medical diagnosis determined by MD
  - A plan of care must be implemented during hospitalization
- ICD-10 codes have been designated as either a major complication/co-morbidity (MCC) or a complication/co-morbidity (CC) under the MS-DRG System
  - E43- Unspecified severe protein-calorie malnutrition (MCC)
  - E44.0-Moderate protein-calorie malnutrition (CC)
  - E44.1-Mild protein-calorie malnutrition (CC)
  - E45-Retarded development following protein-calorie malnutrition (CC)
  - E46-Unspecified protein-calorie malnutrition (cc)

Reference: Academy of Nutrition and Dietetics. Malnutrition Codes Characteristics and Sentinel Markers

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Description	Code
Malnutrition	I5600
Morbid Obesity	I8000
Nutritional approaches while a resident, i.e., tube feeding, parenteral feeding	K0510A2, K0710A2, K0710B2
Swallowing disorder	K0100A-D
Mechanically altered diet	K0510C2

Malnutrition Coding and Reimbursement

- Patient-Driven Payment Model
  - Non-Therapy Ancillary (NTA)
- Coding in MDS is associated with increased NTA cost for post-acute care

Reference: Academy of Nutrition and Dietetics. https://www.eatrightpro.org/news-center/public-policy-news/cms-payment-system-rule-acknowledges-rdns-role-in-hospital-care

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Clinical Pearls

- Screen and assess for nutrient deficiency
  - Provide supplements as needed to meet nutritional needs
- Monitor for malnutrition
- Optimize protein intake
- Ensure Adequate energy intake

- Provide ONS to meet intake to nutritional needs gap
- Promote adequate hydration
- Address underlying conditions
- Collaborate with the interdisciplinary team

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Resources

- 2025 NPIAP Guidelines: https://internationalguideline.com/the-international-guideline.
- ASPEN Guidelines: https://nutritioncare.org/clinical-resources/guidelines-standards/.
- Malnutrition Interventions for Older Adults: https://nutritioncare.org/malnutrition-intervention-in-older-adults/.
- ESPEN Guidelines and Position Papers: https://www.espen.org/guidelines-home/espen-guidelines.

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Questions

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Thank you!

- **Credit Hours:** Please watch for a follow up email with detailed information on how to obtain your certificate (instructions are also on the next slide).
- **Please send questions/comments to info@beckydorner.com**

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References for *Evidence-Based Nutrition for Wound Healing and Malnutrition Part I: Nutrition Approaches for Wound Care Webinar* -March 12, 2025

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