

MEDICAL NUTRITION THERAPY PRESSURE ULCER GUIDELINES

Note: The following pressure ulcer guideline is based on the 2014 National Pressure Ulcer Advisory Panel (NPUAP) European Pressure Ulcer (EPUAP) Pan Pacific Pressure Injury Alliance (PPPIA) Guidelines. This guidance is intended to be a template for healthcare organizations to develop their own facility-specific nutrition pressure ulcer guideline. Per the 2014 NPUAP/EPUAP/PPPIA Guidelines, "the recommendations in these guidelines are a general guide to appropriate clinical practice, to be implemented by qualified health professionals subject to their clinical judgment of each individual case and in consideration of the patient's personal preferences and available resources. The guideline should be implemented in a culturally aware and respectful manner in accordance with the principles of protection, participation and partnership".¹ The products named herein are used as examples; use of these products is subject to clinical judgment. This document may be edited per facility needs.

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. Pressure ulcer (PrU) healing is a complex process involving the replacement of injured tissue with new tissue. 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.^{2,3} PrUs 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 ulcers requires a collaborative, interdisciplinary team approach that includes the individual, family, and/or caregiver.¹ Table 1 defines the role of specific nutrients for wound management.

Policy:

MNT will be provided to all individuals at nutrition and PrU risk or who have PrUs. The nursing staff and registered dietitian nutritionist (RDN) are responsible for implementing the MNT protocol, monitoring interventions, and documenting outcomes. The goals of nutrition intervention are 1) to provide adequate calories, protein, fluid, vitamins, and minerals; 2) to help reduce the risk of the development of PrUs; and 3) to help promote healing of existing PrUs.

Position Responsibilities:

Registered Dietitian Nutritionist:

- Complete comprehensive nutrition assessment including estimating calories, protein and fluid requirements
- Develop a nutrition diagnosis statement
- Provide dietary recommendations and interventions which may include referral to other disciplines such as speech or occupational therapy
- Monitor and evaluate acceptance of nutrition interventions
- Re-assess status when condition changes or wounds fail to heal

Nurse:

- Screen individual for malnutrition and PrU risk and refer to RDN for nutrition assessment
- Offer supplements as prescribed by the physician and document acceptance or refusal
- Monitor acceptance and tolerance of oral and/or enteral nutrition
- Alert physician and RDN of individuals' changes in nutritional status such as meal/supplement decline or refusal, hydration status, infections, weight fluctuations, failure of PrU healing

Pressure Ulcer Management Procedure

1. The nursing staff will screen and assess the individual's skin condition and PrU risk, at admission, readmission, and when there is a significant change of condition using the facility's validated screening tools. Examples of validated screening tools include the Braden Risk Assessment Scale,⁴ which has a nutrition sub-scale

(total score ≤ 16 indicates high risk for PrU development) and The Mini Nutrition Assessment (MNA)⁵ (score of 8-11 = risk of malnutrition; 0-7 = malnourished). Results from screening will be communicated to the interdisciplinary team and documented in the medical records.

When the nursing staff identifies a PrU, the physician, individual, family, and RDN will be notified immediately. The Interdisciplinary team will implement protocols for support surfaces, treatments, and PrU nutrition management according to the facility's policy and the physician's orders.

2. All individuals at risk for malnutrition and/or skin breakdown or those with a PrU will be promptly referred to the RDN. The RDN will review the results of the screening tools, the medical record, and complete a comprehensive nutrition assessment.

3. After interviewing the individual and reviewing the nutrition assessment, the RDN will write a nutrition diagnosis and calculate the individual's estimated requirement for calories, protein, and fluids. In addition to protein and calories, individuals not consuming a balanced diet may require a multivitamin plus minerals with 100% of the Reference Daily Intake (RDI's). The RDN will collaborate with the interdisciplinary team and implement MNT for PrU management (*See Table 2 and Figure 1*).

The MNT treatment plan will focus on providing sufficient calories as the energy source and protein for tissue maintenance and repair. All stages of PrU healing require adequate protein, and research indicates increasing the amount of protein provided is an effective intervention to promote healing.^{6,7} Certain amino acids, such as arginine and citrulline, become conditionally essential during periods of stress and trauma.⁸⁻¹¹ Key vitamins and minerals also play a role in healing wounds.¹

4. The management plan will be implemented based on the individual's condition and desired outcomes. The plan will be monitored weekly or per facility policy for individuals at malnutrition and/or PrU risk or those with a PrU. Interventions and outcomes will be documented in the care plan in the medical record.

5. The management plan will be implemented based on the individual's condition and desired outcomes. The plan will be monitored weekly or per facility policy. Interventions and outcomes will be documented in the medical record. Consider the following NPUAP/EPUAP/PPPIA nutrition guidelines:

Energy Intake:

- 1. Provide individual energy intake based on underlying medical condition.**
- 2. Provide 30-35 kcalories/kg body weight for adults at risk of a pressure ulcer who are assessed as being at risk of malnutrition.**
- 3. Provide 30-35 kcalories/kg body weight for adults with a pressure ulcer who are assessed as being at risk of malnutrition.**
- 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.
- 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. Caloric needs are ideally met by a healthy diet; however, some individuals are unable or unwilling to consume an adequate diet. Overly restricted diets may make food unpalatable and unappealing, and therefore reduce 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.** Oral nutritional supplements (ONS), enhanced foods, and food fortifiers can be used to combat unintended weight loss and malnutrition.
- 7. Consider enteral or parenteral nutritional support when oral intake is inadequate.** This must be consistent with the individual's goals. If oral intake is inadequate, enteral or parenteral nutrition may be recommended if consistent with the individual's wishes. Enteral (tube) feeding is the

preferred route if the gastrointestinal tract is functioning. The risks and benefits of nutrition support should be discussed with the individual and caregivers early on, and should reflect the individual's preferences and goals for care.

Protein Intake:

1. **Provide adequate protein for positive nitrogen balance for adults assessed to be at risk of a pressure ulcer or who already have a pressure ulcer.**
2. **Offer 1.25 to 1.5 grams of protein/kg body weight daily for adults at risk of a pressure ulcer who are assessed to be at risk of malnutrition when compatible with goals of care, and reassess as condition changes.**
3. **Offer 1.25-1.5 grams of protein/kg body weight daily for adults with an existing pressure ulcer who are assessed to be at risk of malnutrition when compatible with goals of care, and reassess as condition changes.**
4. **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.**
5. **Assess renal function to ensure that high levels of protein are appropriate for the individual.**
6. **Supplement with high protein, arginine and micronutrients for adults 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.**

Hydration:

1. **Provide and encourage adequate daily fluid intake for hydration for an individual assessed to be at risk for or with a pressure ulcer. This must be consistent with the individual's comorbid conditions and goals.**
2. **Monitor individuals for signs and symptoms of dehydration including change in weight, skin turgor, urine output, elevated serum sodium, and serum osmolality.**
3. **Provide additional fluid for individuals with dehydration, elevated temperature, vomiting, profuse sweating, diarrhea, or heavily draining wounds.**

Vitamin and Minerals:

1. **Provide/encourage individuals assessed to be at risk of pressure ulcers or with a pressure ulcer to consume a balanced diet including good sources of vitamins and minerals.**
2. **Provide/encourage individuals assessed to be at risk of a pressure ulcer or with a pressure ulcer to take vitamin and mineral supplements when dietary intake is poor or deficiencies are confirmed or suspected**

Table 2. MANAGEMENT PLAN FOR INDIVIDUALS AT Malnutrition and PRESSURE ULCER Risk or with a Pressure Ulcer(s)

Risk Factors	<p>PrU Trigger Conditions:</p> <p>Screening tool triggers for PrU risk: Braden Scale <16 and/or MNA[®] ≤11</p> <p>Unintended wt. loss ≥ 5% in 30 days, ≥10% in 180 days</p> <p>BMI (≤ 18.5 or ≥ 30)</p> <p>Poor oral intake</p> <p>Receiving enteral/parenteral nutrition</p> <p>Immobility, decline in ADLs</p> <p>Infections, including urinary tract infections, pneumonia, wound infections</p> <p>Diagnosis of under-nutrition/malnutrition/hydration deficits</p> <p>Diminished functional status: measured by hand grip strength</p> <p>Decline in ability to eat independently</p> <p>Chewing/swallowing problem/dysphagia</p> <p>Co-morbid conditions: end-stage renal disease, diabetes,</p> <p>Cognitive impairments: dementia, end-stage Alzheimer's</p>
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	<p>Skin exposure to urinary or fecal incontinence</p> <p>History of PrUs</p> <p>Medical record confirms Stage I, II, III, IV or multiple PrUs or chronic non-healing PrUs</p>
Nutrition Assessment	<p><u>RDN Assess:</u></p> <p>Diagnosis/medical condition</p> <p>Review of skin assessment /nutrition screening tools</p> <p>Diet and /or enteral /PN Nutrition</p> <p>Current weight, Determine deviation from current body weight</p> <p>Determine nutritional needs</p> <p>Interview for food preferences & intolerances</p> <p>Medications/medical treatments (antibiotics, steroids)</p> <p>Average food/ fluid intake, Medical food supplements (% consumed)</p> <p>Chewing/swallowing status/ability to eat independently (refer to speech therapist or occupation therapist when appropriate)</p> <p>Dehydration risk factors</p> <p>For stage III,IV or multiple PrUs: Renal & liver function to ensure tolerance of protein levels, hydration status for individuals with elevated temperature, vomiting, profuse sweating or heavily draining wounds</p>
Nutrition Intervention	<p><u>Estimate Nutrient Needs:</u></p> <p>Calories: 30-35 kcalories/kg/body weight (adjust per clinical condition)¹</p> <p>Protein: 1.25-1.5 grams/kg/body weight (adjust per clinical condition)¹</p> <p>Fluid: 1 mL per day per kcalorie consumed, unless contraindicated & monitor hydration status)¹</p> <p>Offer preferred food/beverage at appropriate texture</p> <p>Liberalize restrictive diets</p> <p>Offer vitamin/mineral supplement with 100% of RDI's if intake is poor or deficiencies are suspected or confirmed¹</p> <p>Weigh weekly or per facility policy</p> <p>Request MD Order for Pro-Stat®*:</p> <p>Pro-Stat® Sugar Free, dose as per nutrition assessment for individuals at malnutrition and/or PrU risk</p> <p>Stage I, II PrUs: Pro-Stat® Sugar Free, dose as per nutrition assessment until healed</p> <p>Stage III, IV, Multiple PrUs, Chronic wounds: Pro-Stat® AWC, dose as per nutrition assessment until healed</p> <p>Provide Pro-Stat® with medication pass or via enteral feeding tube</p>
Monitor	<p><u>Monitor Weekly or Per Facility Policy:</u></p> <p>Skin condition and/or wound status</p> <p>Acceptance and tolerance of oral intake and/or supplement</p> <p>Calorie, protein & fluid adequacy compared to estimated requirements</p> <p>Weight status</p> <p>Laboratory values, if available</p> <p>Ability to meet nutrient needs orally</p> <p>Consider enteral feeding consistent with individual's wishes, if intake is inadequate</p>
Evaluate	<p><u>Outcomes:</u></p> <p>Intact skin or progress toward healing</p> <p>Improved and/or stable nutritional status</p> <p>Intake meets estimated caloric, protein and fluid requirements</p> <p>Effectiveness of intervention in collaboration with interdisciplinary team and adjust, if condition changes, improves or declines</p> <p>Document and re-assess per policy</p>

Table 1. NUTRIENTS TO SUPPORT & REPAIR SKIN INTEGRITY		
Nutrient	Role in Skin Integrity	Recommendation
Calories	Energy source to preserve lean body mass ¹	30–35 kcal/kg body weight (adjust per clinical condition, weight change, or level of obesity) ¹
Protein	Tissue maintenance & repair, building lean body mass ¹	1.25–1.5 g/kg body weight (adjust per clinical condition) ¹

Fluid	Normal cell function & tissue integrity, adequate blood volume & circulation, nutrient & oxygen supply to tissues to support wound repair ¹	1 mL/kcalorie consumed, monitor hydration status ¹
Vitamin C	Connective tissue & collagen synthesis, supports formation of new blood vessels & wound strength, and enhances activation of leukocytes & macrophages to the wound site ¹	(RDA = 90 mg for males; 75 mg for females); UL = 2000 mg/day
Zinc	Essential trace mineral for DNA synthesis, cell division, collagen formation, protein synthesis, and immunity, all necessary processes for tissue regeneration & repair ¹	(RDA = 11 mg for males; 8 mg/day for females); UL = 40 mg/day.
Arginine	A biological precursor to nitric oxide, which increases blood flow, which can support collagen in wounds ⁸	Supplemental arginine has shown benefits in wound healing ⁷⁻¹¹
Citrulline	Metabolizes into arginine which can help increase Nitric Oxide production ¹⁰	Consumption can raise plasma arginine levels more efficiently than supplemental arginine because it bypasses intestinal and liver breakdown. ^{6,12}

1. National Pressure Ulcer Advisory Panel, et al. Cambridge Media;2014:75.
2. Stratton RJ, et al. *Ageing Res Rev.* 2005;4:422-50.
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10. Cereda E, et al. *Ann Intern Med.* 2015;162:167-74.
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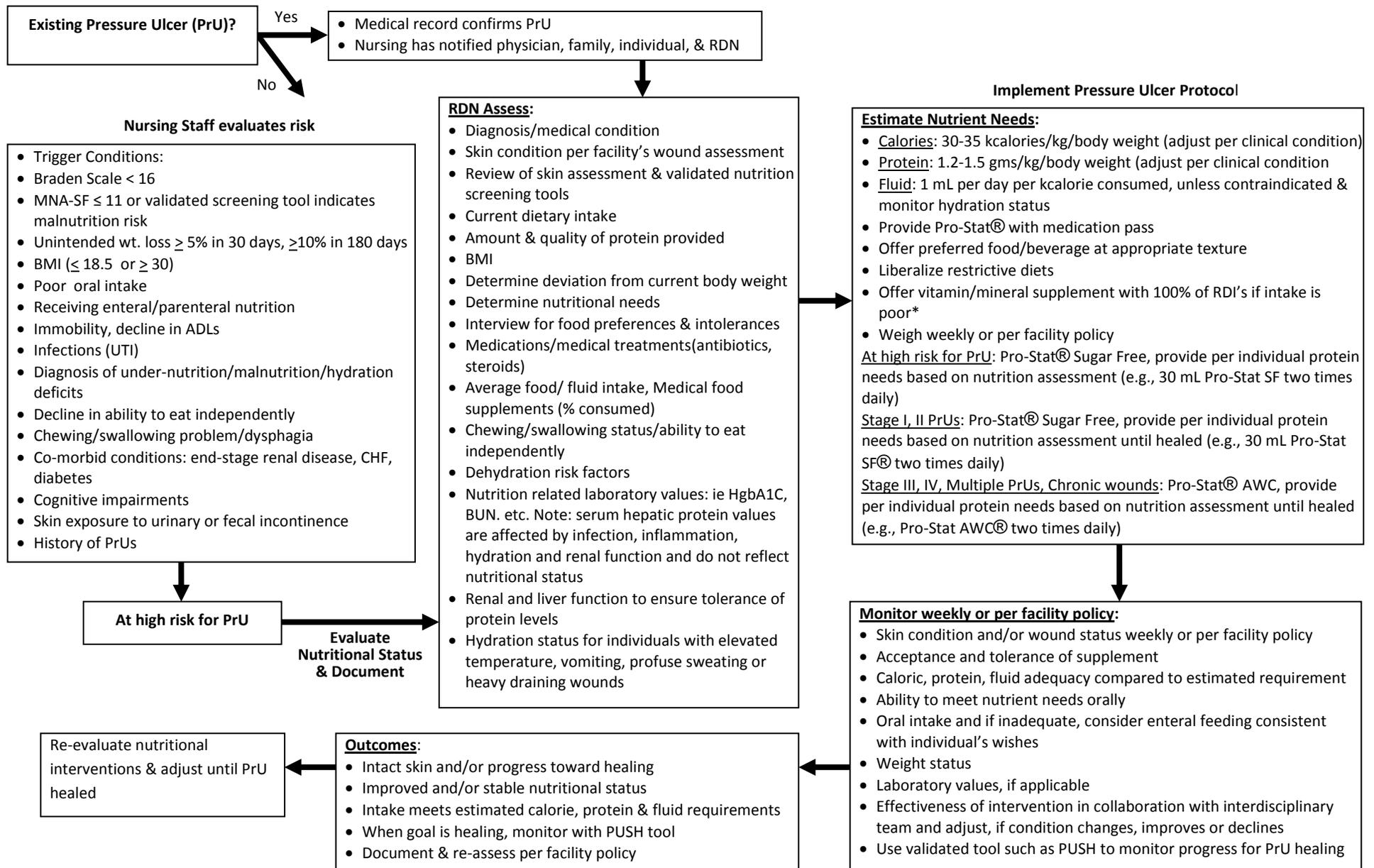
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Guide for the Management of Pressure Ulcers (PrUs)

Figure 1.



1. National Pressure Ulcer Advisory Panel, et al. Cambridge Media;2014:75. 2. Braden B, et al. 1998. <http://www.bradenscale.com/images/bradenscale.pdf>. Accessed Mar 11, 2015. 3. Nestle Nutrition Institute. 1994. <http://www.mna-elderly.com>. Accessed Mar 11, 2015. 4. Curis E, et al. *Amino Acids*. 2005;29:177-205. 5. Wu GY, et al. *Biochem J*. 1992;281 (Pt 1):45-8. 6. Schwedhelm E, et al. *Br J Clin Pharmacol*. 2008;65:51-9. 7. Desneves KJ, et al. *Clin Nutr*. 2005;24:979-87. 8. Kirk SJ, et al. *Surgery*. 1993;114:155-9; discussion 60. 9. Cereda E, et al. *Ann Intern Med*. 2015;162:167-74. 10. Morris SM, Jr. *J Nutr*. 2004;134:2743S-7S; discussion 65S-67S.

Stage II Pressure Ulcer



Existing Pressure Ulcer?

Yes

- MT is a 159 lb male admitted to a rehabilitation center with a hip fracture and a stage II pressure ulcer on his sacrum.
- Nursing has notified physician, family, individual, & RDN

Implement Pressure Ulcer Protocol

Registered Dietitian Assesses Patient Nutritional Intake & Weight History:

- The registered dietitian interviews MT to assess his food choices and discovers that he rarely eats fruits or vegetables.
- He currently eats only 50% of his meals and has lost 9 lbs. (5%) since his admission three weeks ago.

Estimate Patient's Nutrient Needs:

- Based on the nutrition guidelines for a pressure ulcer, MT's protein requirement is 85-102 grams per day (68 kg x 1.25-1.5 grams protein per day).

MT 's typical daily menu	
Morning meal: 2 eggs 2 slices of toast 8 fl oz of milk	Protein 25 g
Noon meal: Meat sandwich (3oz meat) Chips Soft drink	16 g
Afternoon Snack: 2 cookies 8 fl oz of milk	9 g
Evening meal: 3 oz. of meat Slice of bread A large serving of potatoes or corn Soft drink	27 g
Before bed meal: Popcorn Soft drink	2 g
	Total = 79 g
<i>50% of Meal Consumed = 39.5 g Protein</i>	

Assessment:

- Total daily protein intake = 36.5 grams per day does not meet estimated protein needs, does not eat a balanced diet, and a recent significant weight loss.¹
- Patient is at risk for malnutrition.

Recommendation and Plan:

The registered dietitian recommends the following;

1. Pro-Stat® Sugar Free 30 mL twice daily in-between meals to meet his protein needs.
2. A daily multivitamin to meet his micronutrient needs that include Vitamin C and Zinc.
3. Continue Pro-Stat® Sugar Free 30 mL twice daily until wound heals.



1. CMS's RAI Version 3.0 Manual. <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/MDS-30-RAI-Manual-V113.pdf>. Accessed Nov 5, 2015.

Stage III Pressure Ulcer



Existing Pressure Ulcer?

Yes

- FS is a 180 lb adult with a chronic stage IV pressure ulcer on her coccyx and a stage III pressure ulcer on her heel.
- Nursing has notified physician, family, individual, & RDN

Implement Pressure Ulcer Protocol

- Registered Dietitian Assesses Patient Nutritional Intake & Weight History:**
- The registered dietitian interviews FS and notes that she has a good appetite and tries to eat a balanced diet.
 - Recent MD order for 250 mg Vitamin C twice daily and 10 mg Zinc three times daily.
- Estimate Patient's Nutrient Needs:**
- Based on the nutrition guidelines for pressure ulcers, ST requirement is 102- 123 grams of protein per day (81 kg x 1.25-1.5 g per day).

FS 's typical daily menu	
Morning meal: 4oz citrus juice or fruit 1 egg 1 slice of toast ½ cup cereal w/ 8 oz. of milk	Protein 18 g
Noon meal: Large salad w/ 2oz meat or cheese Crackers Serving of fruit 8 oz. of milk	21 g
Afternoon Snack: Ice Cream Coffee	3 g
Evening meal: 3oz of meat or fish Serving of rice or potatoes 1 slice of bread Vegetable and Salad	21 g
Before bed meal: Peanut butter Crackers 8oz. milk	16 g
	Total = 79 g

- Assessment:**
- Total daily protein intake = 79 grams per day does not meet estimated protein needs, eats a balanced diet, and no recent significant weight changes.
 - **Patient does not seem to be at risk for malnutrition.**

- Recommendation and Plan:**
- The registered dietitian recommends the following;
1. Pro-Stat Sugar Free AWC 30 mL twice daily in-between meals to meet her protein needs.
 2. Discontinue daily micronutrient supplementation of 250 mg Vitamin C twice daily and 10 mg Zinc three times daily since AWC contains adequate amounts of both nutrients.
 3. Continue Pro-Stat AWC 30 mL twice daily until wound heals.

