McKESSON

McKesson Wound*Care* Companion™

Nutrition Guide

Your go-to, take anywhere guide for information on the effects of nutrition in advanced wound care.

Preface

The following pressure injury (PI) guidelines are based on the 2019 National Pressure Injury Advisory Panel (NPIAP), European Pressure Ulcer Advisory Panel (EPUAP), Pan Pacific Pressure Injury Alliance (PPPIA) Guidelines. This guidance is intended to be a resource for healthcare professionals to aid in the development of specific nutrition pressure injury guidelines for your care setting. Per the 2019 NPIAP/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".[1] The products named herein are used as examples; use of these products is subject to clinical judgment.

Guide Reference

Nutritional Risk Factors and Triggers for Developing Wounds

NUTRITIONAL RISK FACTORS AND TRIGGERS FOR DEVELOPING WOUNDS

It is important for health care providers to understand all the risk factors associated with skin breakdown. Poor nutritional status is correlated with chronic wounds. High-risk individuals can be identified by screening for nutritional risk factors, along with understanding pressure injury (PI) triggers. This will help clinicians establish preventive interventions to help decrease an individual's risk factors for the development of PIs.

Note: Wounds refers to any chronic non-healing wound, such as a PI, surgical site wound, trauma wound, burn injury, etc.

Consequences of Malnutrition[2,3,4]

Malnutrition has been identified as a key risk factor for the development of PIs and delayed wound healing. A higher propensity of complications can result from malnutrition. Some of the detrimental consequences are listed below.

- Complement and antibody levels
- T-cell function and phagocytic activity
- Collagen accumulation
- Epithelialization and fibroblast proliferation
- Wound tensile strength and angiogenesis
- Healing and treatment effectiveness

- Risk of developing more pressure injuries
- Wound severity
- Risk of local and/or systemic infection
- Prolongs the inflammatory phase
- Hospital Length of Stay (LOS)
- Mortality/Morbidity

Nutritional Risk Factors and PI Triggers[5]

Screening tool triggers for PI risk:

- Braden Scale < 16 and/or MNA® ≤ 11
- Unintended weight loss > 5% in 30 days, > 10% in 180 days
- BMI (< 18.5 or > 30)
- Poor oral intake
- Receiving enteral/parenteral nutrition
- Immobility
- Spinal cord injuries
- Decline in activities of daily living (ADLs)
- Infections, including urinary tract infections, pneumonia, wound infections
- Diagnosis of under-nutrition/malnutrition
- Hydration deficits
- Diminished functional status as measured by hand grip strength
- Decline in ability to eat independently
- Chewing or swallowing problem/dysphagia
- Co-morbid conditions: end-stage renal disease, diabetes
- Cognitive impairments: dementia, end-stage Alzheimer's
- Skin exposure to urinary or fecal incontinence
- History of PIs
- Medical record confirms Stage 1, 2, 3, 4, or multiple PIs; or chronic non-healing PIs

Inflammatory Conditions[6,7]

Inflammatory conditions are a PI trigger as they increase wound risk and decrease wound healing

Examples:

- Obesity
- Advanced age
- Hypoxia/vascular disease
- Malnutrition
- Infection/sepsis/wound debridement
- Chronic diseases like diabetes/chronic renal failure
- Various drugs/chemotherapy

Conditions or Diseases Associated with Inflammation[8,9]

Inflammation is not the same as infection

Infection is caused by a bacterium, virus or fungus
Inflammation is the body's response to infection, injury, acute and chronic illness, etc.

Severe acute inflammatory response

Critical illness, major infection/sepsis, ARDS, SIRS, severe burns, major abdominal surgery, multi-trauma and closed head injury

Mild/moderate chronic inflammatory response

Many other conditions or diseases: CVSD, CHF, Cystic Fibrosis, COPD, Crohn's disease, celiac disease, chronic pancreatitis, rheumatoid arthritis, diabetes, sarcopenic obesity, metabolic syndrome, malignancies, infections, CVA, dementia, neuromuscular disease, pressure wounds, periodontal disease, organ failure/transplant

Determining the Types and Characteristics of Malnutrition

DETERMINING TYPES AND CHARACTERISTICS OF MALNUTRITION

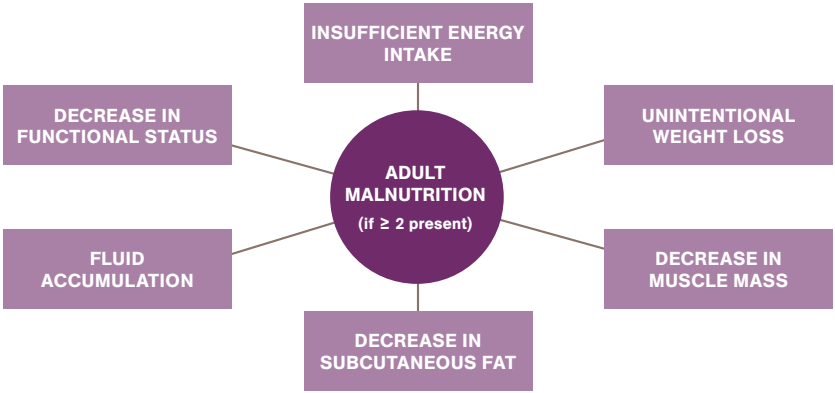
Current approaches to the diagnosis of malnutrition vary widely.

This has resulted in a lack of standardization and confusion with regard to defining the characteristics of malnutrition.

In 2009, the Academy of Nutrition and Dietetics (AND) and The American Society of Parenteral and Enteral Nutrition (ASPEN) collaborated to standardize the approach in the diagnosis of malnutrition.[10]

These new standards identified six characteristics to assess for the presence of malnutrition.

Characteristics the RDN Uses to Identify and Diagnose Adult Malnutrition[10]

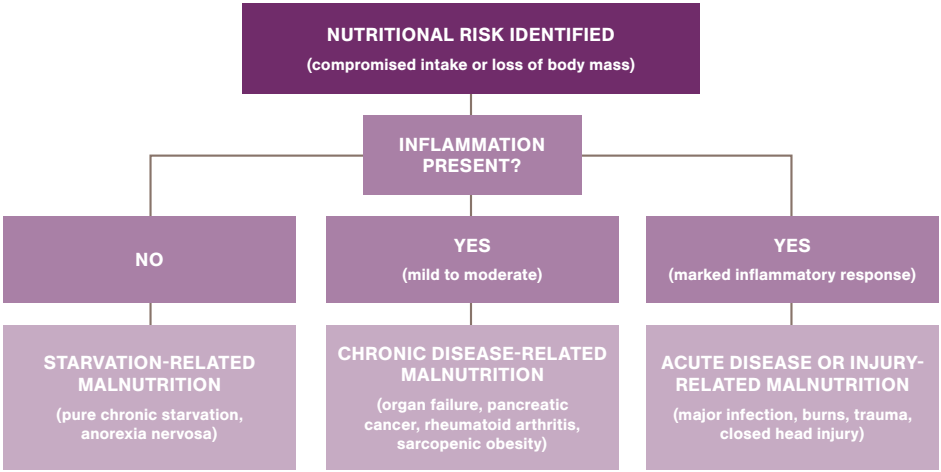


ASPEN's & AND's Characteristics to Diagnose/Document Malnutrition[11]

CHARACTERISTIC	ASSESSMENT
Inadequate Intake	< 50-75% estimated needs Hx/observed
Unintended Weight Loss	Any BMI, follow Blackburn Criteria*
Physical Exam	Muscle Loss Subcutaneous Fat Loss Fluid Accumulation (both localized & generalized)
Functional Status	Hand Grip Strength

*www.health.harvard.edu/bmi-calculator

Etiology-Based Malnutrition Definitions[12]



Nutritional Assessment

NUTRITIONAL ASSESSMENT

The nursing staff and registered dietitian nutritionist (RDN) are responsible for implementing the medical nutrition therapy (MNT) protocol, monitoring interventions and documenting outcomes.

According to NPIAP and EPUAP, a nutritional assessment should be completed by an RDN if a PI risk factor is identified.

The nursing staff should screen and assess the individual's skin condition and PI risk by using the facility's validated screening tools at designated intervals: at admission, at readmission and when there is a change of condition. Examples of validated screening tools include the Braden Risk Assessment Scale.[13]

Clinical Assessment Tools

MNA®[14] (Mini Nutritional Assessment): Validated nutrition screening tool to identify geriatric patients age 65 and older who are malnourished

MUST[15] (Malnutrition Universal Screening Tool): Five-step screening tool that identifies adults at risk for malnutrition

Risk Assessment Tools[16]: Tools that help identify those at high risk for PIs, urinary tract infections and constipation; and those needing help in maintaining intestinal microbiota balance

EAT-10: A Swallowing Screen Tool[14]: A tool that helps to measure swallowing difficulties

Malabsorption Index[14]: A tool that helps to identify problems with malabsorption and provides guidance in the selection of enteral products

Dehydration Risk Appraisal Checklist[17]: A tool to helps measure the risk for hydration problems

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RDN Assessment[5]

- Diagnosis/medical condition
- Skin assessment and nutrition screening tools
- Diet and/or enteral/parenteral nutrition
- Current weight, determine deviation from current body weight
- Nutritional needs
- Food preferences and intolerances
- Medications/medical treatments (antibiotics, steroids)
- Average food/fluid intake, medical food supplements (percentage consumed)
- Chewing and swallowing status and ability to eat independently (refer the patient to a speech therapist or occupational therapist when appropriate)
- Dehydration risk factors
- For stage 3, 4, or multiple PIs: monitor renal and liver function to ensure tolerance of protein levels; hydration status for individuals with elevated temperature, vomiting, profuse sweating, or heavily draining wounds

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Nutrition Focused Physical Assessment[10]

A Nutrition Focused Physical Assessment (NFPA), conducted by an RDN, incorporates the techniques of a physical assessment with a focus on the evaluation of nutrient deficiencies.

FAT STORES	MUSCLE STATUS	FLUID STATUS
Orbital Fat Pads	Temples (temporalis)	Ankle edema
Triceps Skin Fold	Clavicals (pectoralis and deltoids)	Sacral edema
Fat Overlaying Lower Ribs	Shoulders (deltoids)	Ascites
	Interosseous	
	Scapula (latissimus dorsi, trapezius, deltoids)	
	Thigh (quadriceps)	
	Calf (gastrocnemius)	

*This is not an inclusive list for fat, muscle or fluid status.

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Systematic Approach to Assessment[8,18]

History and clinical diagnosis

Evaluate an individual's past medical history along with his or her chief complaints. This will be helpful in determining the risk of malnutrition, along with the presence or absence of inflammation. It is now understood that inflammation is a potent contributor to malnutrition and a barrier to wound healing.

Clinical signs/physical exam

A physical exam can help reveal the presence of several of the diagnostic characteristics of malnutrition, along with any clinical signs of inflammation. This component of clinical practice is important as part of the nutrition care process and competency requirements for all Registered Dietitians.

Systematic Approach to Assessment (con't)[8,18]

Laboratory indicators

Obtaining laboratory data provides clinicians essential information to properly manage the care of residents who have wounds. Laboratory values are useful in assessing and monitoring chronic medical conditions, along with an individual's nutritional status. A baseline for care should be established by checking various laboratory data along with a routine monitoring plan. If a skin condition persists, these values can be tracked regularly to ensure that other factors are not contributing to poor healing.

Functional outcomes

The goal in nutritional assessment is to evaluate outcomes. Hand grip strength is an example of a functional measurement that is useful as part of the assessment process.

Dietary Assessment[8,9]

Food/nutrition-related history

- If necessary, information can be obtained from medical records, family and caregivers
- Obtain data regarding food allergies or intolerances, dietary restrictions and other factors that influence nutrient intake
- Obtain a complete medication list and supplement list
- Obtain pertinent data related to psychosocial, socioeconomic and functional behaviors that may influence nutrient consumption
- Patients often present with acute events superimposed upon chronic health conditions; therefore, it is common for patients to have had compromised intake and malnutrition for extended time periods

NUTRITIONAL ASSESSMENT

Anthropometric Data[8,9]

Body Weight	Measure to monitor weight change trends Self-reported weights or other sources of data may be unreliable
Height	Measure in standing position if possible Height can be roughly estimated by doubling the arm span measurement (from the patient's sternal notch to the end of the longest finger) Height in older persons can be estimated from knee height
Weight Standardized for Height	Reference table's ideal body weight – limited by subjective interpretation of frame size and inadequate reference data for many population groups Body Mass Index (BMI, kg/m2) – practical measure of body size and indirect measure of body fatness

Sentinel Markers

Measure of functional status

- Hand grip strength*
  - Dynamometer
  - Standards (excellent, good, average, fair, poor) for dominant hand by gender and age
  - Maximum reading (kg) from three attempts, allow one minute of rest between attempts
- Three or six minute walk
- Stair climbing, chair raise, balance
- Peak expiratory flow

*Strongest correlation to date with muscle mass and nutritional status

Sentinel Markers - Inability or Unwillingness to Eat

Compromised nutrient intake of varying degree and duration

- ≥ 5 days with intake of ≤ 50%, ≤ 75% of total estimated energy requirement (acute time frames)
- ≥ 1 month with intake of ≤ 50%, ≤ 75% total estimated energy intake (chronic time frames)

NOTE: Avoid contributing to iatrongenic malnutrition in these patients.

Sentinel Markers - Unintended Weight Change

INTERPRETATION OF PERCENT WEIGHT LOSS**	SEVERE	TIME
Acute Time Frames	> 2%	1 week
	> 5%	1 month
	> 7.5%	3 months
Chronic Time Frames	> 5%	1 month
	> 7.5%	3 months
	> 10%	6 months
	> 20%	1 year

**Height, weight and usual weight need to be obtained in order to determine the percentage and interpret the significance of weight loss.

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Sentinel Markers - Changes in Body Composition

Loss of subcutaneous fat

- Orbital, triceps, fat overlying the ribs

Loss of lean muscle mass

- Temples (temporalis muscle)
- Clavicles (pectoralis and deltoids)
- Shoulders (deltoids)
- Interosseous muscles
- Scapula (latissimus dorsi, trapezius, deltoids)
- Thigh (quadriceps)
- Calf (gastrocnemius)

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Sentinel Markers - Changes in Body Composition (con't)

Fluid accumulation

- Localized (hand, lower extremity, or scrotal edema)
- Generalized fluid accumulation – clinically evident edema on examination

NOTE: Edema may mask weight loss and may be reflected as weight gain.

Energy, Protein, Micronutrient and Fluid Requirements for Wound Healing

ENERGY, PROTEIN, MICRONUTRIENT AND FLUID REQUIREMENTS FOR WOUND HEALING[19]

- Proper nutritional support is considered a significant factor in the prevention and treatment of pressure injuries
- Calories in the form of carbohydrate, protein and fat are essential for anabolism, angiogenesis, nitrogen synthesis and collagen formation, along with many other pertinent functions
- Protein is needed for tissue maintenance, tissue repair and building lean body mass
- Micronutrients, such as trace elements and minerals, are critical during all phases of wound healing
- Ensuring adequate fluid intake is necessary for maintaining adequate blood volume and circulation, as well as nutrient and oxygen supply to tissues

2015 - 2020 Dietary Guidelines for Americans[20]

Key recommendations: Consume a healthy eating pattern that accounts for all food and beverages within an appropriate calorie level.

CATEGORY	GUIDELINE
Vegetables	A variety of vegetables from all of the subgroups - dark green, red and orange, legumes (beans and peas), starchy and other
Fruits	Fruits, especially whole fruits
Protein	A variety of protein foods, including seafood, lean meats and poultry, eggs, legumes (beans and peas), nuts, seeds and soy products
Grains	Grains, at least half of which are whole grain
Dairy	Fat-free or low-fat dairy, including milk, yogurt, cheese and/or fortified soy beverages
Fats	Healthy fats and oils - olive oil, nuts, avocados and fatty fish

2015 - 2020 Dietary Guidelines for Americans[20]

The 2015-2020 Dietary American Guidelines do not take into account the increase in protein requirements needed for wound healing. Protein is essential for all stages of wound healing. It is important to encourage adequate protein intake, along with optimal calorie consumption.

OPTIMAL CALORIE CONSUMPTION

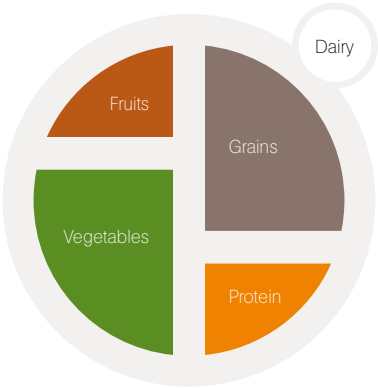
CONSUME LESS THAN 10% OF CALORIES PER DAY FROM ADDED SUGARS

CONSUME LESS THAN 10% OF CALORIES PER DAY FROM SATURATED FATS

IF ALCOHOL IS CONSUMED, IT SHOULD BE CONSUMED IN MODERATION

(Up to one drink per day for women and two for men)

Food Choices Matter: Variety, Amount and Nutrition[21]



Use the My Plate tool as a reference to help assess an individual's intake. It is important to encourage consumption of a balanced diet, which includes good sources of calories, protein, fluids, vitamins and minerals.

For women and men 51+ the following food types are recommended for consumption each day:

- Fruit - 1.5 to 2 cups
- Grains - 5 to 6 servings
- Dairy - 2 to 3 servings
- Protein - 5 to 6 oz
- Vegetables - 2 to 2.5 cups

Requirements for Wound Healing[22]

Estimate the patient's nutrient needs:

- Calories: 30-35 kcalories/kg/body weight (adjust per clinical condition)
- Protein: 1.25-1.5 grams/kg/body weight (adjust per clinical condition)
    - NPIAP guidelines indicate consideration of arginine for Stage 2,3, and 4 PIs
- Fluid: 1 mL per day per calorie consumed
    - Unless adjustments required due to various conditions such as: CHF, COPD or CKD

Notes

- Monitor hydration status and reasons for fluid loss (wound drainage, fever, vomiting, diarrhea, sweating, air-fluidized beds)
- Offer preferred foods and beverages at the appropriate texture and temperature
- Liberalize restrictive diets
- Offer vitamin/mineral supplements with 100% of RDIs if the patient's intake is poor or deficiencies are suspected or confirmed
- Weigh the patient weekly or per the facility policy

ENERGY, PROTEIN, MICRONUTRIENT AND FLUID REQUIREMENTS FOR WOUND HEALING[23-29]

ROLE IN SKIN INTEGRITY	RECOMMENDATIONS
Vitamin C	
Is important for connective tissues and collagen synthesis Supports formation of new blood vessels and wound strength Enhances activation of leukocytes and macrophages to the wound site	**RDA** 90 mg/day for males 75 mg/day for females **UL** 2000 mg/day
Zinc	
Is an essential trace mineral for DNA synthesis, cell division, collagen, formation, protein synthesis and immunity Is required for all necessary processes for tissue regeneration and repair	**RDA** 11 mg/day for males 8 mg/day for females **UL** 40 mg/day

ENERGY, PROTEIN, MICRONUTRIENT AND FLUID REQUIREMENTS FOR WOUND HEALING[23-29]

ROLE IN SKIN INTEGRITY	RECOMMENDATIONS
L-Arginine	
A biological precursor to nitric oxide, which increases blood flow, which can support collagen in wounds	Supplemental arginine has shown benefits in wound healing[24-28]
Citrulline	
Metabolizes into arginine, which can help increase nitric oxide production	Consumption of citrulline can raise plasma arginine levels more efficiently than does supplemental arginine Bypasses intestinal and liver breakdown[23,29]

Recommendations for Key Nutrients[30]

STAGES	MVI	VITAMIN C	ZINC	VITAMIN A
1	Daily, as needed	100-200 mg/day	15 mg/day If deficient: 50 mg twice/ day for 10-14 days	5,000 IU/day If deficient: 10,000-50,000 IU/day for 10 days
2	Daily, as needed	100-200 mg/day	15 mg/day If deficient: 50 mg twice/ day for 10-14 days	5,000 IU/day If deficient: 10,000-50,000 IU/day for 10 days

Recommendations for Key Nutrients (con't)[30]

STAGES	MVI	VITAMIN C	ZINC	VITAMIN A
3	Daily	1000-2000 mg/day in divided doses for 10-14 days	20-40 mg/day If deficient: 50 mg twice/ day for 10-14 days	5,000 IU/day If deficient: 10,000-50,000 IU/day for 10 days
4	Daily	1000-2000 mg/day in divided doses for 10-14 days	20-40 mg/day If deficient: 50 mg twice/ day for 10-14 days	5,000 IU/day If deficient: 10,000-50,000 IU/day for 10 days

Nutritional Goals for Wound Healing

- Early intervention
- Provide adequate micro and macronutrients to support healing without overfeeding (treat suspected deficiencies)
- Provide adequate protein to promote positive nitrogen balance
- Maintain glycemic control - monitor Hb A1c
- Monitor food intake (actual vs. desired)
- Maintain optimal hydration status and perfusion to wounded tissue (monitor for signs and symptoms of dehydration)
- Avoid complications with nutritional support regimens
- Implement the 2019 NPIAP/EPUAP/PPPIA Guidelines according to the individual's assessed needs

Hydration Goals for Wound Management

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

Nutritional Monitoring and Protocols

NUTRITIONAL MONITORING AND PROTOCOLS

A systematic and comprehensive monitoring approach is warranted to identify and treat any underlying problems that impact wound healing.

Routine monitoring and validated assessment tools need to be integrated into an individual's care plan and a facility's clinical protocols.

Effective management involves a collaborative team approach to assure a reduction of impediments to wound healing.

Provide enriched food and/or oral nutritional supplements between meals, if appropriate with the individual's plan of care.

See Clinical Tools (Provided by Nestlé and Nutricia), Pressure Injury Care Therapy Guidelines and Management Options, Product Selection Guidelines and information on laboratory tests available through McKesson at mms.mckesson.com.

Nutritional Monitoring

- Skin condition and/or wound status
- Acceptance and tolerance of oral intake and/or supplement
- Calorie, protein and fluid adequacy compared to estimated requirements
- Weight status
- Monitor patient's ability to meet nutrient and fluid needs orally
    - Consider enteral feeding consistent with the individual's wishes, if intake is inadequate
- Monitor patient's laboratory values
    - See suggestions available through McKesson's list of wound care lab offerings

Criteria to Help Assess the Need for Tube Feeding[31]

- Inadequate oral intake despite oral nutritional supplements
- Continued weight loss and poor wound healing
- Dysphagia issues and aspiration risk
- Extensive assistance required for eating
- Malnutrition or risk of malnutrition, as indicated by the nutrition screening tool
- Clinical and physical assessment
- Weight loss ≥ 5% in one month or ≥ 10% in three months
- Inadequate fluid intake and/or dehydration (≤ 1500 mL/day)

The Importance of Laboratory Values for Wound Care

Abnormal lab values impact the treatment and progression of wounds. Below is a list of laboratory tests that are recommended as part of your clinical protocol to optimize skin management. Please note that there is no single laboratory test or panel that allows one to diagnose a malnutrition syndrome, so laboratory data must be appropriately used in combination with other assessment tools.

1. Malnutrition / Inflammatory status: Pre-albumin, Albumin, CRP
2. Absence or Prevalence of Diabetes: BS, HgB A1C
3. Hydration status: serum sodium, BUN / Cr (specific gravity)
4. Infection or UTI status: CBC, Urinalysis (specific gravity)
5. Anemia: Hemoglobin, Hematocrit, MCV

As previously noted, serum protein levels do not solely correlate with nutrition status. However, the clinician should review the laboratory values for other concerns that may inhibit PI healing, such as anemia and uncontrolled blood glucose levels in people with diabetes.

Normal Values for Parameters Correlated with PI[32]

If feasible, assess nutritional laboratory parameters regularly for patients with documented deficiencies or for those at high PI risk. Sample values are presented in the table below. Laboratory results are not a substitute for documenting individual nutritional intake and status.

PARAMETER	ADULT	CHILD	INFANT/NEONATE
Pre-albumin	10-40 mg/dL	16-28.1 mg/dL	10.4-11.4 mg/dL
Total protein	6-8 g/dL	4.3-7.6 g/dL	6.2-8.0 g/dL
Serum albumin	3.4-5.0 g/dL	3.2-5.1 g/dL	3.2-4.8 mg/dL
Hematocrit (%)	F: 35-47% M: 37-51%	31-43%	42-68%
Transferrin	200-400 mg/dL		130-275 mg/dL
Total Lymphocycte count	2500/µL	350-400/µL	1100-1200/µL

Nutritional Support Wisdom

- Prevention is the key. Screen and assess the nutritional status of individuals at risk for or with PIs
- Wound healing takes time
- Chronic wounds don't happen overnight
- Provide consistent and adequate nutrition support
- Nutrition is only one aspect of treatment
- There is no magic pill or supplement to heal wounds
- Develop Quality Indicators for PI prevention and treatment

Products

Nestlé Health Science Oral Supplements per Serving

DESCRIPTION	cal/mL	SERVING	PROTEIN (g/L)	CARB (g/L)	FAT (g/L)
ARGINAID®					
L-Arginine Powder	0.11 (when mixed with 237 mL water)	25 kcal	4.5g L- arginine	2	0
ARGINAID EXTRA®					
Clear Liquid with Supplemental L-Arginine	1.06	250 kcal	10.5 Includes 4.5g L-arginine	52	0
BENEPROTEIN®					
Whey Protein Powder	N/A	25 kcal	6	0	0

PRODUCTS

Nestlé Health Science Oral Supplements per Serving (con't)

DESCRIPTION	cal/mL	SERVING	PROTEIN (g/L)	CARB (g/L)	FAT (g/L)
BOOST® High Protein					
High Protein	1.0	240 kcal	15	33	6
BOOST® VHC					
Very High Calorie	2.25	530 kcal	22	52	26
BOOST® Glucose Control					
Glucose Control	1.06	250 kcal	14	23	12

Nestlé Health Science Oral Supplements per Serving (con't)

DESCRIPTION	cal/mL	SERVING	PROTEIN (g/L)	CARB (g/L)	FAT (g/L)
GLUTASOLVE®					
L-Glutamine/Powder	0.75 (when mixed with 120 mL water)	90 kcal	15g L-glutamine	7	0
IMPACT ADVANCED RECOVERY®					
Very High Protein Immune Modulating with Supplemental L-Arginine	1.1	200 kcal	18 Includes 4.2g L-arginine	15	8

Nestlé Health Science Tube Feeding Formulas

DESCRIPTION	cal/mL	PROTEIN (g/L)	CARB (g/L)	FAT (g/L)	FIBER (g/L)
DIABETISOURCE® AC					
Diabetes Management	1.2	60	100	58.8	15.2
IMPACT®					
Immune Support for Surgical and Trauma Patients	1.0	56 Includes 12g L-arginine	132	28	N/A
IMPACT® Peptide 1.5					
Peptide-Based, Calorically-Dense for Immune Support	1.5	94 Includes 18.7g L-arginine	140	63.6	N/A

Nestlé Health Science Tube Feeding Formulas (con't)

DESCRIPTION	cal/mL	PROTEIN (g/L)	CARB (g/L)	FAT (g/L)	FIBER (g/L)
REPLETE®					
High Protein	1.0	64	112	34	N/A
REPLETE® Fiber					
High Protein Fiber-Containing	1.0	64	124	34	15.2

PRODUCTS

Nutricia North America

Ready-to-drink low volume liquid medical foods

DESCRIPTION	cal/mL	SERVING 1 fl oz (30mL)	PROTEIN (g)	CARB (g)	FAT (g)
Pro-Stat® Sugar Free					
Hydrolyzed complete protein in a low volume	3.3	100 kcal	15	10	0
Pro-Stat® Sugar Free AWC (Advanced Wound Care)					
Hydrolyzed complete protein in a low volume with added arginine, citrulline, cystine, vitamin C and zinc	3.3	100 kcal	17	7	0
Pro-Stat® MAX					
Hydrolyzed whey-based protein in a low volume	2.7	80 kcal	11	9	0

PRODUCTS

Nutricia North America (con't)

Ready-to-drink low volume liquid medical foods

DESCRIPTION	cal/mL	SERVING 1 fl oz (30mL)	PROTEIN (g)	CARB (g)	FAT (g)
Pro-Stat® Renal Care					
Hydrolyzed complete protein with prebiotic fiber in a low volume	3.3	100 kcal	15	6	0
UTI-Stat®					
Urinary tract protection complex w/ cranberry concentrate and 4 other key ingredients in a low volume	2.3	70 kcal	0	17	0

PRODUCTS

Nutricia North America (con't)

Ready-to-drink low volume liquid medical foods

DESCRIPTION	cal/mL	SERVING 1 fl oz (30mL)	PROTEIN (g)	CARB (g)	FAT (g)
Fiber-Stat®					
Low volume liquid prebiotic fiber to help support bowel health	1.7	50 kcal	0	25	0
Diff-Stat® is a capsule product.					
Diff-Stat®					
Dietary supplement providing a blend of 2 probiotics and a prebiotic that helps to promote intestinal health*	n/a	5 kcal (2 capsules or 1 powder pack)	0	Capsules: <1g Powder Pack: 1g	0

*Statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

REFERENCES

1. European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Quick Reference Guide. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2019.
2. Posthauer ME, et al. *Adv Skin Wound Care*. 2010;23;560-572.
3. Fry DE, et al. *Arch Surg*. 2010;145:148-151.
4. MacKay D, et al. *Altern Med Rev.* 2003;8:359-377.
5. Adapted from National Pressure Ulcer Advisory Panel, et al. Cambridge Media;2014:75.
6. Malone A, Hamilton C. *Nutr Clin Prac*. 2013:28:639-650.
7. Guo S, et al. JDR.2010, 89:219-229.
8. Jensen GL, et al. *Clin Nutr* 2010;29;151-153.
9. Jensen GL, et al. *JPEN J. Parenter Enteral Nutr.* 2010;34;156-159.
10. White JV, et al. Academy Malnutrition Work Group, A.S.P.E.N. Malnutrition Task Force and the ASPEN Board of Directors. Consensus Statement: Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition: Characteristics Recommended for the Identification and Documentation of Adult Malnutrition (Undernutrition). *JPEN J Parenter Enteral Nutr.* 2012 36: 275-283.

REFERENCES (CON'T)

11. Nutrition Care Manual 2013.
12. Jensen GL.*JPEN J Parenter Enteral Nutr.* 2009;33:710.
13. Braden B, et al. 1998. www.bradenscale.com/images/bradenscale.pdf. Accessed Mar 11, 2015.
14. Property of Nestlé Health Science.
15. BAPEN 2003 first published May 2003 by MAG (Malnutrition Advisory Group).
16. Property of Nutricia Advanced Medical Nutrition.
17. Mentes, JC., Iowa Veterans Affairs Nursing Research Consortium 2004.
18. ASPEN Adult Nutrition Support Core Curriculum. 3rd Edition.
19. Stechmiller JL. *Nutr Clin Prac.* 2010:25:61-68.
20. http://www.choosemyplate.gov/snapshot-2015-2020-dietary-guidelines-americans#recommendations.
21. http:// www.choosemyplate.gov/MyPlate.
22. Posthauer ME, et al. *Adv Skin Wound Care*. 2015;28:175-188.
23. Dorner B, et al. *Adv Skin Wound Care.* 2009;22:212-21.
24. Trans Tasman Dietetic Wound Care Group. 2011. http://www.guideline.gov/content.aspx?id=34765. Accessed Aug 10, 2015.
25. Curis E, et al. *Amino Acids*. 2005;29:177-205.

REFERENCES (CON'T)

26. Van Anholt RD, et al. *Nutrition.* 2010;26:867-72.
27. Cereda E, et al. *Ann Intern Med.* 2015;162:167-74.
28. Schwedhelm E, et al. *Br J Clin Pharmacol.* 2008;65:51-9.
29. Morris SM, Jr. *J Nutr.* 2004;134:2743S-7S; discussion 65S-67S.
30. ASPEN Adult Nutrition Support Core Curriculum, 2nd edition, 2012.
31. Evelyn Phillips, MS,RD,LDN,CDE on 2/18/16 and Nutrition Management Protocol for Pressure Ulcers: ww.nutritioncaremanual.org.
32. Association for the Advancement of Wound Care October 1, 2010 page 2.

MCKESSON WOUND*CARE* COMPANION™ NUTRITION COMPONENT

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Product Formulary

MANUFACTURER	MFG CATALOG NUMBER	E1 ITEM NUMBER	EC ITEM NUMBER	DESCRIPTION	SELL UOM	CS/ EA
Nestlé Health Science	19660000	443991	19662600	ARGINAID EXTRA®, Orange Burst	8 fl. oz.	CS
Nestlé Health Science	35984000	746880	59842600	ARGINAID®, Cherry	0.32 oz. packets	CS
Nestlé Health Science	35983000	746879	59832600	ARGINAID®, Orange	0.32 oz. packets	CS
Nestlé Health Science	28410000	405661	28412600	BENEPROTEIN®, Unflavored Powder	8 oz. canisters	CS
Nestlé Health Science	28430000	531547	28432600	BENEPROTEIN®, Unflavored Powder	7 g. packets	CS
Nestlé Health Science	4390094139	800905	41392600	BOOST® High Protein, Very Vanilla	8 fl. oz.	CS
Nestlé Health Science	4390018216	804208	82162600	BOOST® VHC, Very Vanilla	8 fl. oz.	CS
Nestlé Health Science	36508100	693726	65082600	DIABETISOURCE® AC, SpikeRight® PLUS	1000 mL	CS
Nestlé Health Science	4390036583	804537	65832600	DIABETISOURCE® AC, SpikeRight® PLUS	1500 mL	CS

Product Formulary (con't)

MANUFACTURER	MFG CATALOG NUMBER	E1 ITEM NUMBER	EC ITEM NUMBER	DESCRIPTION	SELL UOM	CS/ EA
Nestlé Health Science	36500000	525738	50362600	DIABETISOURCE® AC, Unflavored	250 mL	CS
Nestlé Health Science	28330000	447291	28332600	GLUTASOLVE®, Unflavored	22.5 g. packets	CS
Nestlé Health Science	4390099291	1013588	43902615	IMPACT ADVANCED RECOVERY®, Vanilla	178 mL	CS
Nestlé Health Science	4390097400	773736	43902600	IMPACT® Peptide 1.5, Unflavored	250 mL	CS
Nestlé Health Science	35810800	693721	58102600	IMPACT®, SpikeRight® PLUS	1000 mL	CS
Nestlé Health Science	35810000	222806	35812600	IMPACT®, Unflavored	250 mL	CS
Nestlé Health Science	9871626358	662459	28342600	REPLETE® Fiber, SpikeRight® PLUS	1000 mL	CS
Nestlé Health Science	9871626359	720658	28652600	REPLETE® Fiber, SpikeRight® PLUS	1500 mL	CS
Nestlé Health Science	9871616245	243773	62452600	REPLETE® Fiber, Unflavored	250 mL	CS
Nestlé Health Science	9871626356	669416	62632600	REPLETE®, SpikeRight® PLUS	1000 mL	CS
Nestlé Health Science	9871616249	254696	62492600	REPLETE®, Unflavored	250 mL	CS

Product Formulary (con't)

MANUFACTURER	MFG CATALOG NUMBER	E1 ITEM NUMBER	EC ITEM NUMBER	DESCRIPTION	SELL UOM	CS/ EA
Nutricia North America	10064	502031	10122600	Pro-Stat® Sugar Free, Wild Cherry Punch	30 fl. oz. bottle	CS
Nutricia North America	10464-U	625275	14642600	Pro-Stat® Sugar Free, Wild Cherry Punch	1 fl. oz. unit dose	CS
Nutricia North America	30064	534275	30642600	Pro-Stat® Sugar Free, Citrus Splash	30 fl. oz. bottle	CS
Nutricia North America	30464-U	852220	34642610	Pro-Stat® Sugar Free, Citrus Splash	1 fl. oz. unit dose	CS
Nutricia North America	40064	558704	46402600	Pro-Stat® Sugar Free, Vanilla	30 fl. oz. bottle	CS
Nutricia North America	40464-U	625276	40462600	Pro-Stat® Sugar Free, Vanilla	1 fl. oz. unit dose	CS
Nutricia North America	50064	728063	50062600	Pro-Stat® Sugar Free, Grape	30 fl. oz. bottle	CS

Product Formulary (con't)

MANUFACTURER	MFG CATALOG NUMBER	E1 ITEM NUMBER	EC ITEM NUMBER	DESCRIPTION	SELL UOM	CS/ EA
Nutricia North America	50464-U	919031	50462600	Pro-Stat® Sugar Free, Grape	1 fl. oz. unit dose	CS
Nutricia North America	40130	628435	41302600	Pro-Stat® AWC, Wild Cherry Punch	30 fl. oz. bottle	CS
Nutricia North America	40130-U	628435	13042600	Pro-Stat® AWC, Wild Cherry Punch	1 fl. oz. unit dose	CS
Nutricia North America	40230	780220	40232600	Pro-Stat® AWC, Citrus Splash	30 fl. oz. bottle	CS
Nutricia North America	40230-U	785548	42302600	Pro-Stat® AWC, Citrus Splash	1 fl. oz. unit dose	CS
Nutricia North America	90001	785548	90112601	Pro-Stat® MAX, Grape	30 fl. oz. bottle	CS
Nutricia North America	90001-U	1006328	90012610	Pro-Stat® MAX, Grape	1 fl. oz. unit dose	CS

Product Formulary (con't)

MANUFACTURER	MFG CATALOG NUMBER	E1 ITEM NUMBER	EC ITEM NUMBER	DESCRIPTION	SELL UOM	CS/ EA
Nutricia North America	60064	834719	60642609	Pro-Stat® Renal Care, Tangerine	30 fl. oz. bottle	CS
Nutricia North America	60064-U	1152121	60642610	Pro-Stat® Renal Care, Tangerine	1 fl. oz. unit dose	CS
Nutricia North America	70001	579746	70002600	Fiber-Stat®, Prune	30 fl. oz. bottle	CS
Nutricia North America	70400-U	699761	77402700	Fiber-Stat®, Prune	1 fl. oz. unit dose	CS
Nutricia North America	60001	662525	10062606	UTI-Stat®, Cranberry	30 fl. oz. bottle	CS
Nutricia North America	60001-U	860996	60002600	UTI-Stat®, Cranberry	1 fl. oz. unit dose	CS
Nutricia North America	80001	712154	88002700	Diff-Stat®, Plain	60 capsules	CS
Nutricia North America	80001-U	718424	80032700	Diff-Stat®, Unflavored	2 g. powder packs	CS

Product Formulary (con't)

MANUFACTURER	MFG CATALOG NUMBER	E1 ITEM NUMBER	EC ITEM NUMBER	DESCRIPTION	SELL UOM	CS/ EA

Product Formulary (con't)

MANUFACTURER	MFG CATALOG NUMBER	E1 ITEM NUMBER	EC ITEM NUMBER	DESCRIPTION	SELL UOM	CS/ EA

Product Formulary (con't)

MANUFACTURER	MFG CATALOG NUMBER	E1 ITEM NUMBER	EC ITEM NUMBER	DESCRIPTION	SELL UOM	CS/ EA

Product Formulary (con't)

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Product Formulary (con't)

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Product Formulary (con't)

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