

# A Costly Deficiency

## Nutritional Assessment and Risk of Pressure Ulcer Development

By Marti Andrews, PhD, RD

**H**ospitalized patients being treated for pressure ulcers alone incur an average cost of more than \$3,700, according to recent research reports.

These costs are in the form of dressing changes, nursing care, physical therapy, medications, nutritional support and physician services.

Additionally, the presence of pressure ulcers interferes with the quality of life and increases morbidity.

Clients who are malnourished are at significant risk for developing pressure ulcers, defined as “any lesion caused by unrelieved pressure resulting in damage of underlying tissue.”

Clearly, the emergence of pressure ulcers can lengthen recovery time, debilitate patients and lead to significant increases in treatment costs.

### A Low-Cost Solution

Nutrition therapies, including assessment and intervention, can be low-cost treatments for many conditions, including pressure ulcers. Nutritional support not only saves health care dollars, it also contributes to positive health outcomes.

Effective nutritional assessment and subsequent support are essential to the prevention and treatment of pressure ulcers. The Agency for Health Care Policy and Research has recognized the critical role of nutrition, noting that adequate nutrient levels are imperative for both pressure ulcer prevention and wound healing.

### What to Look For

Frequently noted nutritional indicators of pressure ulcer development risk are the low intake of calories and protein, and below-normal serum albumin levels.

The most obvious indicator of a precipitous drop in serum albumin is an involuntary, rapid increase or decrease in body weight of 5 percent or more.

One difficulty in treating clients who are potentially malnourished is the ability to accurately and efficiently assess their nutritional status. While com-

**Figure 1**  
**Sample Nutritional Assessment Guide for Patients with Pressure Ulcers**

Patient Name: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

To be filled out for all patients at risk on initial evaluation and every 12 weeks thereafter, as indicated. Trends will document the efficacy of nutritional support therapy.

#### Protein Compartments

##### Somatic:

Current Weight (kg) \_\_\_\_\_  
Previous Weight (kg) \_\_\_\_\_ (\_\_\_\_ date)  
Percent Change in Weight \_\_\_\_\_

Height (cm) \_\_\_\_\_  
Height/Weight \_\_\_\_\_  
Current Body Mass Index (BMI) \_\_\_\_\_ ( $\frac{[wt]}{[ht]^2}$ )  
Previous BMI \_\_\_\_\_ (\_\_\_\_ date)  
Percent Change in BMI \_\_\_\_\_

##### Visceral:

Serum Albumin \_\_\_\_\_  
(Normal 13.5 mg/dL)  
Total Lymphocyte Count (TLC) \_\_\_\_\_ (optional)  
(White Blood Cell count x percent Lymphocytes/100)

##### Guide to TLC:

Immune competence  $\geq 1,800 \text{ mm}^3$   
Immunity partly impaired  $< 1,800$  but  $\geq 900 \text{ mm}^3$   
Anergy  $< 900 \text{ mm}^3$

#### State of Hydration

24-Hour Intake \_\_\_\_\_ mL      24-Hour Output \_\_\_\_\_ mL

Note: Thirst, tongue dryness in non-mouth-breathers and tenting of cervical skin may indicate dehydration. Jugular vein distension may indicate overhydration.

#### Estimated Nutritional Requirement

Estimated Nonprotein Calories (NPC) \_\_\_\_\_ / k g      Estimated Protein - (g/kg)  
Actual NPC \_\_\_\_\_ / kg      Actual Protein \_\_\_\_\_ (g/kg)

#### Recommendations/Plan

- 1.
- 2.
- 3.
- 4.

Source: Agency for Health Care Policy and Research

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plex scientific procedures exist to accurately measure nutritional status, these techniques are costly and not readily available.

However, nutritional assessment emphasizing physiological parameters are available, affordable and more practical in clinical settings. The chart developed by the AHCPR (Fig. 1) is a practical, useful tool designed to assess nutritional status.

This nutritional assessment should be conducted on initial evaluation and then every three months as needed. Clinically significant malnutrition is diagnosed if any one of these factors is present:

- Serum albumin is less than 3.5 mg/dL.
- Total lymphocyte count is less than 1,800/mm<sup>3</sup>.
- Body weight has decreased by more than 5 percent.

Vitamin and mineral deficiencies also contribute to the risk of pressure ulcer formation and delayed

wound healing and, therefore, should be evaluated. Fortunately, a simple checklist of clinical signs can be used to quickly screen for these nutrient deficiencies (Fig. 2).

## A Team Effort

While registered dietitians must take a lead role in the nutritional assessment and support of clients, all health care providers should be aware of basic strategies for identifying clients whose nutritional status may contribute to the development of pressure ulcers.

Nurses, physical therapists, occupational therapists and pharmacists should be able to identify patients at risk for nutrition-related problems.

Clients identified through the screening efforts of these health care providers should undergo a complete nutritional assessment by a professional trained in nutrition, such as a registered dietitian. The team approach will help avoid undetected malnutrition and can be used to ensure the implementation of appropriate and timely nutritional support.

## Dietary Changes

Rigorous nutritional support must be implemented once malnutrition is identified. The initial approach should focus on increasing dietary intake of calories and protein through regular meals, frequent snacks and complete supplements.

High-calorie, high-protein foods (such as peanut butter, cheese, eggnog, milkshakes, custard and pudding) are appropriate dietary recommendations.

Many cases of malnutrition can be easily rectified with simple dietary changes. Should these changes be insufficient or impractical, oral supplements to increase nutritional intake should be immediately introduced. Such supplements should be high in protein as well as vitamins and minerals.

Nutritional supplements are available commercially in a variety of forms (liquids and solids of various textures) and flavors. Tube feedings should be used as a last defense against malnutrition, but are warranted when oral supplements are ineffective.

Given that nearly one of every four clients in skilled care facilities may develop debilitating and costly pressure ulcers, it is important that comprehensive care be employed to prevent and treat these wounds.

Nutritional assessment and support has emerged as an essential component of comprehensive care and a relatively simple means of reducing the risk of pressure ulcer development.

*Marti Andrews, PhD, RD, is a nutrition consultant for Ross Products Division, Abbott Laboratories, 625 Cleveland Ave., Columbus, OH 43215; 614/624-3381; fax: 614/624-3108; e-mail: marti.andrews@rossnutrition.com*

Figure 2

### Oral and Cutaneous Signs of Vitamin or Mineral Deficiencies

Clinical Signs (by Site)	Deficiency(ies)
<b>Oral Cavity</b>	
Chelosis and angular stomatitis	Vitamin B2
Glossitis (i.e., pink or magenta discoloration with loss of villi)	Multiple B vitamins
<b>Eyes</b>	
Scleral changes	Vitamin A
Bitot's spots	Vitamin A
<b>Face</b>	
Seborrhea-like dryness and redness of nasolabial fold and eyebrows	Zinc
<b>Upper Extremities</b>	
Purplish blotches on lightly traumatized areas (due to capillary fragility and subepithelial hemorrhages)	Vitamin C
Extreme transparency of skin of hands ("cellophane skin")	Vitamin C
<b>Abdomen/Buttocks</b>	
Waxy, perifollicular hyperkeratosis	Vitamin A
<b>Lower Extremities</b>	
Superficial flaking of epidermis, large flakes of dandruff	Essential fatty acids
Cracks in skin between islands of hyperkeratosis:	
• Pigmented	Nicotinamide (niacinamide)
• Nonpigmented	Vitamin A

Note: These manifestations may be seen in disease processes other than vitamin deficiencies. If the cause is in fact a deficiency, clinical improvement should be evident four weeks after supplementation is begun.

Source: Agency for Health Care Policy and Research