

# Malnutrition and Wound Healing

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**W**ound healing is an anabolic process that requires a steady supply of nutrients and fluid to the wound bed. Malnutrition interrupts this healing process and is associated with delayed wound healing, increased risk of infection, prolonged hospital stays and poor health outcomes.<sup>1</sup> Malnutrition is also a culprit in the development of wounds, especially pressure injuries.<sup>2</sup> Not only does malnutrition have a negative impact on the health and quality of life of patients, but also it increases health-care costs and rates of hospital re-admission.<sup>3</sup>

In the general population, malnutrition is rare; however, the risk increases with advancing age and for those living in poverty or with cognitive decline. The presence of a wound increases nutrient needs and may be associated with poor intake or inflammation, which may result in a decline in nutritional status and an increased risk for developing malnutrition. A hospital experience itself may have a negative impact on nutritional status due to the need to be fasting for therapeutic tests or procedures, interrupted meal times, pain, illness and poor appetite.<sup>4</sup> Prompt identification of individuals with malnutrition or at risk of malnutrition can offset patient suffering, long hospital stays and wound chronicity.

## Prevalence of Malnutrition

Until recently, malnutrition was largely unrecognized and overlooked. In a Canadian prospective cohort study, adult malnutrition was identified in a startling 45% of those admitted to hospitals over a three-year observation period.<sup>5</sup> Similar rates of malnutrition have been observed around the world.<sup>6</sup>

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Initially established in 2009 to review the current prevalence of malnutrition in hospitals, the Canadian Malnutrition Task Force (CMTF) was formed with the mission to develop and implement strategies to prevent, detect and treat malnutrition. As part of this, Canadian Malnutrition Awareness Week is now celebrated in Canada annually in the fall. With continued efforts it will become standard procedure to screen for malnutrition upon admission to hospitals in Canada and help draw attention to the impact of malnutrition on health outcomes.



## Malnutrition: Hard to Define

Defining malnutrition is challenging, as it is hard to pinpoint the boundaries between normal and abnormal nutrition. There are limited serologic tests to definitively diagnose malnutrition. In general, malnutrition is defined as a reduced nutrition intake, relative to need, that results in negative changes to body composition and function. Increased nutrition needs are seen in patients with malabsorption diseases or changes to nutrient utilization, or whose wounds have high exudate. The presence of chronic disease and varying degrees of inflammation can also impact malnutrition.

In 2012, to help with consistency of care, the Academy of Nutrition and Dietetics and the American Society for Parenteral and Enteral Nutrition (ASPEN) put forward a standard diagnosis. The consensus that was adopted indicates malnutrition is usually diagnosed when two or more of the following nutrition characteristics are identified:<sup>8</sup>

- Insufficient energy intake
- Weight loss
- Loss of muscle mass
- Loss of subcutaneous fat
- Fluid accumulation (that may mask weight loss)
- Diminished functional status (as measured by hand-grip strength)

## Malnutrition Defined

Malnutrition includes both the deficiency or excess (or imbalance) of energy, protein and other nutrients. In clinical practice, the focus is undernutrition, or inadequate intake of energy, protein and nutrients. Undernutrition affects body tissues, functional ability and overall health. In hospitalized patients, undernutrition is often complicated by acute conditions (e.g., a trauma), infections and diseases that cause inflammation.<sup>7</sup>

## Weight Loss Puts Patients at Risk

Weight loss is often the initial symptom of malnutrition, as the body breaks down fat and protein stores to feed the wound. A patient exhibiting unintentional weight loss greater than 5% over a three- to six-month period should be flagged as being at high risk of malnutrition.<sup>9,2</sup> While there is often a strong focus on patients with a low body mass index (BMI < 20), there is a growing appreciation that malnutrition affects overweight (BMI > 25) and underweight individuals alike.<sup>10</sup> Clinicians should be aware that overweight status does



**To identify malnutrition risk, ask the following:**

- Have you lost weight in the last six months without trying?
- Have you been eating less than usual for more than a week?

If the patient answers “Yes” to both ... they are at nutrition risk.

*(Canadian Malnutrition Screening Tool)*



not always imply good nutrition; absolute body weight may not be as important as the degree of weight loss.

## Nutrition Screening Tools

Early identification of those at risk for, or with, overt malnutrition is of the utmost importance. Several validated screening tools have streamlined screening for malnutrition in adults (see Table 1). Choice of screening tools will vary depending on the patient population screened: whether inpatient, living in a residential facility, or community dwelling. (Screening for malnutrition in children uses different tools that are beyond the scope of this article.) Screening tools all have

overlapping features; most attempt to determine recent weight loss and poor nutritional intake. Most require the clinician to have access to the patient’s recent weight and height measurements, but often these are missing from the patient’s chart. Validated screening tools to help identify patients with, or at risk for, malnutrition are simple to use and can be administered by any member of the team in clinics or upon admission to hospital. Rescreening annually or semi-annually is recommended, especially when a patient’s medical condition changes or if a wound is not healing as predicted.<sup>11</sup> To date, only the Mini Nutrition Assessment (MNA) screening tool has been validated for patients with pressure injuries.<sup>11</sup>

Subscales of the Braden Risk and Skin Assessment, and the Pressure Injury Prevention Points and Nutrition Intervention (National Pressure Ulcer Advisory Panel, now known as the National Pressure Injury Advisory Panel [NPIAP]) can also help to delineate those at risk for wounds



**Table 1:** Nutrition Screening Tools<sup>12</sup>

Screening Tool	Population
Mini Nutrition Assessment SF (MNA®)	<ul style="list-style-type: none"> <li>• Identifies adults 65 years or older, living in long-term care or community dwelling, who are malnourished or at risk for malnutrition</li> </ul>
Malnutrition Universal Screening Tool (MUST)	<ul style="list-style-type: none"> <li>• Identifies adults who are underweight and at risk of malnutrition (acute, long-term care or community)</li> </ul>
Malnutrition Screening Tool (MST)	<ul style="list-style-type: none"> <li>• Identifies adult patients in acute or ambulatory care who are at risk of malnutrition</li> </ul>
Canadian Nutrition Screening Tool (CNST)	<ul style="list-style-type: none"> <li>• Identifies adult patients in acute care at risk of malnutrition</li> </ul>
Short Nutritional Assessment Questionnaire (SNAQ)	<ul style="list-style-type: none"> <li>• Identifies adults who are underweight and at risk of malnutrition (acute)</li> </ul>
Nutri-eSCREEN (online)	<ul style="list-style-type: none"> <li>• Used for self-screening for older adults</li> </ul>



as a result of nutritional complications; however, they do not specifically screen for malnutrition.

## Nutritional Assessment

Once a patient is identified as being at risk, the nutrition care team or a registered dietitian should conduct a comprehensive nutritional assessment in order to build a nutrition care plan.

Health-care providers can use Subjective Global Assessment or inpatient assessment tools to help identify type and severity of the under-nutrition, impact on body composition, loss of functional capacity and barriers to consuming nutritional requirements.

## Intervention

Screening and assessment alone are not enough. Intervention is the next step, and nutritional rehabilitation often requires a team approach. Together the team and patient can develop an individualized care plan to help with weight restoration and improve nutritional status to enhance wound healing. To correct malnutrition, the health-care team must determine the root cause of malnutrition and intervene by following evidence-based guidelines.

Dietitians are a valuable asset to help with the

nutritional assessment and creation of a care plan. Such a plan may specify protein, energy and fluid requirements along with additional micronutrient needs. These elements will support the restoration of lean mass and the nutrients to support wound healing and improve skin integrity. To meet nutrition requirements, often the dietitian will work to liberalize the diet by removing any unnecessary dietary restriction and optimize oral intake through nutrient-dense foods. When foods do not meet nutrition needs, then clinicians may recommend enhanced foods, oral nutrition supplements, or multivitamin and mineral supplements. Enteral or parenteral nutrition support may be indicated in some cases.

## Supporting Good Nutrition: A Team Approach

All members of the team can address good nutrition for wound recovery and prevention of malnutrition through each step of the patient journey. The following are ways to support optimal nutrition intake:

- **Protect mealtimes.** Limit mealtime interruption due to medical tests or procedures.
- **Assist with meals and snacks.** Open containers, place food and drinks within reach, cut up food if necessary.
- **Offer energy-dense snacks with and between meals.** Liberalize diet restrictions to enhance the variety of foods offered.<sup>13</sup>
- **Offer medication with oral liquid supplement, if appropriate.** Small amounts of liquid

## Possible Causes of Malnutrition

- Dysphagia
- Poor appetite
- Poor dentition
- Pain
- Depression or worry
- Chronic disease (e.g., chronic obstructive pulmonary disease, cancer)
- Nausea, vomiting
- Gastrointestinal disorders that prevent absorption (diarrhea, pancreatic insufficiency, inflammatory bowel disease)







supplements spread through the day may be better tolerated than larger amounts.

- **Clarify why the patient is not eating well, and seek to resolve any issues.** Address dentition or swallowing safety, adjust texture of food, add a thickening agent, offer familiar foods, review allergies or intolerances and food preferences.
- **Educate patients on their role in nutrition and healing.** Consider food as medicine, encourage meal completion.
- **Engage the family and encourage them to be a part of the process.** They can provide familiar meals or snacks, visit at mealtimes to help with meal completion, and socialize while eating together.
- **Consider medical support.** Some medications may address early satiety, bloating, constipation or diarrhea. Discuss this with the physician or pharmacist.
- **Consider ongoing nutrition follow-up in discharge planning.** Refer the patient to the outpatient or home-care dietitian for monitoring.

## Conclusion

Identifying and treating malnutrition has the potential to support wound healing, prevent pressure injuries and improve the overall health of our patients. Nutrition intervention is a low risk, cost-effective strategy to reduce health-care expenses. Ongoing rescreening and follow-up of at-risk patients provide an opportunity for health providers to intervene early and prevent malnutrition. 📌

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