

Nourishing Hope: Five Essential Nutrition Tips for Patients With Pancreatic Cancer

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Authors' disclosures of conflicts of interest are found at the end of this article.

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<https://doi.org/10.6004/jadpro.2026.17.2.2>

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Abstract

Pancreatic cancer carries poor overall survival. A high percentage of patients with pancreatic cancer experience a significant amount of weight loss at the time of diagnosis even before starting treatments. Nutritional status and maintaining proper nutrition can be extremely challenging due to multiple factors. Malnutrition can lead to a poorer quality of life, worsening of symptoms, and inability to complete planned treatments, leading to worse clinical outcomes. Evaluating nutritional status and implementing a plan early is essential. Having a good multidisciplinary team and partnering with a registered dietitian should be an integral part of patient care. Nutrition education for clinical teams, patients, and caregivers can help keep patients feeling better and on track with care. Patients should be screened early and routinely for malnutrition, dehydration, and exocrine pancreatic insufficiency. Managing side effects of the disease and engaging patients' caregivers are important to maintaining good nutrition and improving quality of life.

Pancreatic cancer unfortunately has a dismal outcome. The current 5-year survival rate is only at 12.8% (Howlader et al., 2023). It is the sixth leading cause of cancer deaths in the world (Ferlay et al., 2024). Only 14% of patients present with localized disease (Howlader et al., 2023). The recurrence rate even with curative-intent surgery

is approximately 80%, making this a chronic disease for most patients (Brunner et al., 2024). Ensuring this patient population receives appropriate supportive care interventions can keep them on the treatment track, improve the completion of treatment, improve quality of life, and lessen hospital admission rates (Bauer et al., 2024; Muscaritoli et al., 2023).

About 80% of patients diagnosed with pancreatic cancer exhibit a significant amount of weight loss at the time of diagnosis (Mękal et al., 2023). The amount of weight loss in these patients can be substantial and is often a result of malnutrition. According to the World Health Organization, malnutrition is defined as “deficiencies, excesses or imbalances in a person’s intake of energy and/or nutrients” (World Health Organization, n.d.). Cachexia is a complex condition influenced by both tumor growth and treatment (Muscaritoli et al., 2017). It involves inflammation, increased muscle breakdown, and severe weight loss (Muscaritoli et al., 2017). Studies have shown that patients with pancreatic cancer are subject to malnutrition, and many patients present with malnutrition or are at risk for it at the time of diagnosis (Mękal et al., 2023). Malnutrition is a major concern for all patients with cancer, but more so for those with pancreatic cancer (Guan et al., 2017).

Despite the negative impact on treatment outcomes, quality of life, and survival, malnutrition often remains overlooked in cancer patients. Symptoms of the disease and treatments can lead to lower nutritional intake, reduced muscle mass, and a decrease in adherence to treatments due to a decreased quality of life, which can lead to lower overall survival and progression-free survival (Poulia et al., 2022).

Up to 75% of cancer patients are affected by cancer-related malnutrition (Bossi et al., 2021). The Prevalence of Malnutrition in Oncology (PreMiO) study found that over 50% of patients already had nutritional deficiencies at their initial oncology visit, and 43% were at risk for developing malnutrition (Muscaritoli et al., 2017). The subsequent NUTRItional status at first medical oncology visit ON Clinical Outcomes (NUTRIONCO) study revealed a strong connection between these early nutritional factors and patient outcomes (Muscaritoli et al., 2023). In addition, a prospective multicenter study by Latenstein et al. (2020) concluded that only about half of patients with pancreatic cancer with cachexia at diagnosis had nutritional counseling. These findings emphasize the importance of proactive early management of malnutrition in cancer care, which can improve adherence to treatments and quality of life.

Recent studies by Carrato et al. (2022) show the critical role of nutrition in managing patients with pancreatic cancer. The authors focus on upfront screening for malnutrition to improve overall quality of life and also promote screening throughout the treatment course. A higher quality of life was shown to be associated with longer overall survival in this patient population (Carrato et al., 2022). This article highlights five important topics for advanced practitioners to consider to evaluate and improve nutritional status in patients with pancreatic cancer. These elements include identifying and diagnosing malnutrition and those at risk, maintaining hydration, managing symptoms and side effects of the disease, evaluating and managing exocrine pancreatic insufficiency (EPI), and engaging caregivers.

TIP 1: IDENTIFYING AND DIAGNOSING MALNUTRITION

Up to 75% of patients with pancreatic cancer at the time of diagnosis are already considered malnourished (Bossi et al., 2021; Johns Hopkins Medicine, 2024). Identifying patients with pancreatic cancer with malnutrition or at risk for malnutrition is critical. It is also important to continuously evaluate for malnutrition at multiple time points to ensure proper nutrition throughout their journey. Early identification of those who are malnourished or at risk for malnutrition can help improve treatment outcomes, quality of life, and overall survival (Bauer et al., 2024). To identify patients who are malnourished or at risk for malnutrition, the Malnutrition Screening Tool (MST) is a simple validated screening tool that can be used throughout a patient’s care (Figure 1; Ferguson et al., 1999). The MST is a simple two-item screening tool with a malnutrition risk score of 0 to 5. Zero to one indicates the patient is not currently at risk for malnutrition. Two or more indicates the patient is at risk and therefore may benefit from nutritional support and further evaluation.

A certain amount of weight loss over a period of time can indicate that a patient is unable to properly nourish themselves. Typically, unintentional weight loss of 5% to 10% of body weight or more over 3 to 6 months is a sign of malnutrition (NHS Services, 2023). The Subjective Global Assessment (SGA) is the gold standard for diagnosing

Malnutrition Screening Tool (MST)

STEP 1: Screen with the MST

1 Have you recently lost weight without trying?

No	0
Unsure	2

If yes, how much weight have you lost?

2-13 lb	1
14-23 lb	2
24-33 lb	3
34 lb or more	4
Unsure	2

Weight loss score:

2 Have you been eating poorly because of a decreased appetite?

No	0
Yes	1

Appetite score:

Add weight loss and appetite scores

MST SCORE:

STEP 2: Score to determine risk

**MST = 0 OR 1
NOT AT RISK**

Eating well with little or no weight loss

If length of stay exceeds 7 days, then rescreen, repeating weekly as needed.

**MST = 2 OR MORE
AT RISK**

Eating poorly and/or recent weight loss

Rapidly implement nutrition interventions. Perform nutrition consult within 24-72 hrs, depending on risk.

STEP 3: Intervene with nutritional support for your patients at risk of malnutrition.

Notes: _____

Ferguson, M et al. *Nutrition* 1999 15:458-464

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Figure 1. Malnutrition screening tool. Information from Ferguson et al. (1999); Abbot Laboratories (2013).

malnutrition (Baker et al., 1982). It uses clinical history and physical exam findings to stratify patients as either well nourished, mildly/moderately malnourished, or severely malnourished (Canadian Malnutrition Task Force, 2017). This tool can be cumbersome; therefore, practical use in the outpatient setting is often limited.

Patients with pancreatic cancer, or any cancer, have a higher need for protein and calories due to a higher metabolic rate. Once a patient is identified as malnourished or at risk for malnutrition, care teams need to be actively involved in developing an intervention plan. Identifying malnutrition and creating a plan with a patient and their caregiver can help patients empower themselves to get proper nutrition. Having a multidisciplinary team and partnering with a registered dietitian early in the diagnosis is key to getting patients with pancreatic cancer back on track and staying on track with their nutritional status.

TIP 2: MAINTAINING HYDRATION

Proper hydration is critical for patients' nutritional status. Dehydration can lead to poor outcomes such as kidney dysfunction, which can limit therapies. It can also cause delays in treatments due to unexpected visits to clinics and emergency departments or hospital admissions.

Patients with pancreatic cancer often experience a great deal of fluid loss from various mechanisms, making it difficult to maintain proper hydration. Fluid losses can be multifactorial, occurring by having diarrhea, vomiting, fever, or bleeding. These are all common in patients with pancreatic cancer due to the effects on the gastrointestinal system from the disease itself and/or from treatments such as chemotherapy, radiation therapy, or surgical removal of part of the gastrointestinal tract. Some medications can also cause direct fluid losses, such as diuretics or laxatives. Other medications like chemotherapy, diabetic medications, and hypertension medications can cause indirect fluid losses by causing symptoms of diarrhea, vomiting, and decreased oral intake (Bonvissuto, 2022).

Dehydration can worsen symptoms of pain, fatigue, and nausea that can lead to decreased oral hydration intake. This can lead to a vicious cycle

of fluid loss and symptoms leading to dehydration. Routine vital sign measurements can help assess patients for hydration status. Heart rate, blood pressure, respiratory rate, temperature, and weight are all vital signs that can be checked routinely to help evaluate for dehydration (Table 1).

Often, patients with dehydration will have higher heart rates. When dehydrated, the amount of blood circulating through the body is lower, and the heart tries to compensate by beating faster; therefore, the heart rate is increased. Orthostatic hypotension is common as well. Orthostatic hypotension is a drop in blood pressure of 20 mmHg or more with a position change from sitting to standing and is most often caused by an intravascular volume loss (McDermott & Quinn, 2024). Fevers can indicate other etiologies but can also raise concern for dehydration due to losses from sweating, breathing out moisture, and decreasing oral intake. Tachypnea can result due to decreased oxygenation with volume loss. If dehydration is identified, early interventions can be made in a timely fashion to replete fluids to avoid delays in care and treatment.

The amount of water needed to stay hydrated is calculated by dividing the body weight in pounds by half, which provides the number of ounces of water needed per day (Helm, 2023). That amount is without any additional losses due to all the circumstances listed above. If there are additional losses, those also need to be compensated for to reduce the risk of dehydration. Giving a patient a numerical amount to consume daily helps them to visualize what is needed and can improve adherence to the plan. Items that count toward daily hydration are caffeine-free and alcohol-free liquids. Measurement tools can help patients monitor their hydration intake. Water bottles with graduation marks can be helpful. There are even ones with motivation marks on them to encourage drinking.

Leaving the appropriate number of standard-size water bottles out can be a good physical cue of what is needed to be consumed throughout the day. Patients should sip throughout the day rather than trying to gulp down liquids. Gulping down liquids can fill patients up, which can then limit food and caloric intake. Smaller portions are also easier to handle, especially if the patient is experiencing

Table 1. Vital Signs for Dehydration

Vital sign	What to look for	Value
Heart rate	Tachycardia	Heart rate > 100 beats per minute
Blood pressure	Orthostatic hypotension	Reduction in systolic blood pressure of at least 20 mmHg or diastolic blood pressure of 10 mmHg upon sitting to standing
Temperature	Fever	Temperature 100.4°F (38°C) or higher
Respiratory rate	Tachypnea	Respirations ≥ 20 breaths per minute
Weight	Weight loss	Loss greater than 3% over 7 days

Note. Information from Ringer & Lappin (2023).

symptoms of nausea or early satiety. It can be discouraging and overwhelming to try to look at a large amount of fluid and feel it needs to be finished right away. Shakes, smoothies, and soups are options that also count toward hydration and nutrition. Counsel patients to eat foods that have more fluid content, such as fruits, gelatins, and popsicles.

TIP 3: MANAGING SYMPTOMS

Patients with pancreatic cancer often suffer from malnutrition and do not eat well due to symptoms from their disease and/or side effects from their treatments. One longitudinal study of 112 patients with resectable pancreatic cancer showed that symptom severity had the most significant negative impact on perioperative nutritional status (Yang et al., 2024). There is a broad range of symptoms that can limit oral intake and therefore lead to malnutrition. Symptoms may include taste changes and taste sensitivity, nausea, early satiety, bowel changes, fatigue, pain, and post-operative symptoms. Patients undergoing chemotherapy who are malnourished can have increased toxicities resulting in a poorer quality of life and shorter overall survival rate (Bundred et al., 2019). When assessing patients for side effects that may be limiting their eating, a helpful technique is starting from the head and working down the body.

Taste

Many treatments for pancreatic cancer can affect taste. The mouth has different taste buds in different locations that pick up sensations like sour, salty, bitter, and sweet (Johns Hopkins Medicine, 2024). If a patient notes that most foods lack taste, suggest trying condiments on foods to see if the taste can be elevated and food taste more flavorful. Oral mouth

rinses such as baking soda, salt, and water can help keep the mouth and palate clean and may also help with inflammation if there are mouth sores.

Nausea

If there are any anti-nausea medications prescribed, ensure that the patient is taking them correctly. Dietary strategies can be helpful with managing nausea as well. Low-odor foods may be less triggering than foods with a strong smell. Cold or room-temperature fluids or foods can be easier to consume if nauseated. Small and frequent meals (eating every 2–3 hours) can help patients who suffer from nausea or those with early satiety (HCA Healthcare, 2024).

Bowel Changes

Bowel changes are common and have significant impact on quality of life and nutritional status in patients with pancreatic cancer. Both diarrhea and constipation are common. Low-fiber diets and foods that are easier to digest can be helpful for diarrhea. Patients should be encouraged to eat and drink separately, as doing both simultaneously can cause early satiety and more frequent bowel movements. Exercise can help decrease the feeling of fullness in patients with constipation. Also, patients who move more report less fatigue (Johns Hopkins Medicine, 2024).

Fatigue

Fatigue can limit oral intake of nutrition given the work of eating can become more burdensome. Cancer treatments require a higher-than-usual protein requirement. If the patient is unable to consume adequate protein, the body will use protein stores, which is muscle mass. Protein

can lessen fatigue and reduce the loss of muscle mass. When muscle mass is lost, daily activities can become exhausting. If someone is already fatigued, chewing can also be a burden. Patients should be encouraged to choose foods that are soft, moist, and go down easily, such as cottage cheese, scrambled eggs, yogurt, mashed potatoes, smoothies, milkshakes, or soups (Walsh, 2024). Soups can be blended so they are a uniform consistency that can be sipped, which reduces the amount of energy spent chewing.

Pain

For those with abdominal pain, foods lower in fiber and soft foods may be easier to digest and therefore less painful to digest. It is also important to ensure that pain is adequately controlled. It should be confirmed with the patient that pain medications are being taken properly as directed, and with food if indicated.

Post-Operative Symptoms

Some patients with pancreatic cancer undergo surgeries that can include removing part of the stomach and small intestine. There can be unique nutritional concerns in this population postoperatively (Yang et al., 2024). Dumping syndrome can occur, which is the rapid movement of food from the stomach to the small intestine (Hui et al., 2023). As a result, patients can have fatigue right after eating, clamminess, and sometimes diarrhea or abdominal discomfort. Aggravating factors for dumping include high-fiber foods, high-sugar foods, some dairy, and eating and drinking at the same time. Small but frequent meals, low fiber, low sugar, and non-dairy foods, and not consuming liquids within 30 minutes of eating can help reduce dumping in the immediate post-operative period (Hui et al., 2023).

TIP 4: EXOCRINE PANCREATIC INSUFFICIENCY

The pancreas is an organ that plays a role in digestion by helping absorb and metabolize fats, proteins, and carbohydrates by releasing pancreatic enzymes into the duodenum. Damage to the pancreas, as with pancreatic cancer, may obstruct the pancreatic duct and impair enzyme secretion or disrupt pancreatic function, resulting in inadequate enzyme production. This leads to EPI. Surgical removal of part of the pancreas can also result in EPI. Exocrine pancreatic insufficiency can lead to symptoms of malabsorption such as steatorrhea, gas, weight loss, or inability to gain weight if eating adequately, abdominal pain/cramping/bloating, and/or increased frequency of bowel movements. Accurate testing for EPI is limited and can be cumbersome. Since symptoms can widely vary from patient to patient, diagnosing EPI is often a clinical judgment.

An alarming 66% to 92% of patients with pancreatic cancer have EPI (Ghodeif & Azer, 2023). Screening for EPI is extremely important and can be accomplished by reviewing the symptoms of EPI with patients. Asking patients questions regarding their bowel habits and symptoms of EPI or having patients self-report symptoms can lead to early identification and intervention of EPI (Table 2). Exocrine pancreatic insufficiency can develop at any time and therefore screening should be continuous throughout care.

Pancreatic enzyme supplements can be prescribed to help patients digest the foods that are eaten. They are taken with food, as well as with any liquids that contain fat, protein, or carbohydrates. Current guidelines show gaps in literature for standardized dosing, although the most common is 40,000 to 50,000 units of lipase per meal

Table 2. Screening for Exocrine Pancreatic Insufficiency: What to Ask

Have you noticed any of these with your bowel movements?	Do you ever have these symptoms?
<ul style="list-style-type: none"> • Light tan or yellow color • Increased frequency • Loose or unformed • Float • Large volume • Fluffy • Urgent • Oily 	<ul style="list-style-type: none"> • Excessive gas • Pain or cramping after eating • Loss of appetite or food avoidance • Gas or bowel movement with foul/rancid odor • Cramping with bowel movements • Hyperactive bowel sounds • Weight loss despite adequate intake • Unable to gain weight despite adequate intake • Getting full quickly

with potential increases of up to two to three times this amount (Lewis et al., 2024). It is important to continue to monitor patients, educate them on dosing of enzyme supplements, and ensure dosing is optimized by symptom tracking. Studies by Sikkens et al. (2012) have shown that more than 50% of patients with pancreatic cancer with EPI are suboptimally managed. In a more recent study of 75 patients, only about half of patients reported they received detailed information about EPI and the use of enzymes for management (Barkin et al., 2024). To help improve the management of EPI and enzyme use, ask patients to keep a diary of when and how they are taking their enzymes, what their bowel movements are like, how their weight has been, and what they are eating. This can help identify if dosing adjustments are indicated. Engaging patients in the management of their nutrition and enzymes can help empower them to improve their adherence and ultimately improve their care and quality of life.

TIP 5: ENGAGING CAREGIVERS

Caregivers are an integral part in a cancer patient's day-to-day care and should be incorporated into education on nutrition. One of the main things that caregivers can do is help to provide nutritional support for their loved one. It is difficult for caregivers to watch their loved ones not eat and become malnourished. It is important to counsel caregivers to try not to continuously ask the patient what they want to eat. They often do not want to eat anything, and it is too open-ended of a question. It can often elicit a negative barrier, with the answer being "nothing." More productive strategies include having patients write down foods that are appealing to them on good days. Caregivers can then have the patient look at the list when meal preparations are being made. Patients can pick what is most appealing off the list and have choices. The choices do not have to be extensive.

In addition, caregivers can let foods "show up." A caregiver's role is to provide, while the patient's role is to choose to do it or not (Johns Hopkins Medicine, 2024). Caregivers can bring foods to the patient to try to eat but also be mindful of where they are eating. Eating is a social activity, and bringing food to a recliner or bed can be isolating. Maintaining the social environment

may be helpful. Caregivers can engage patients in another activity while eating so they are not focused on the eating aspect or how much food they are eating. This can include bringing them to the table and watching a movie, playing cards, or listening to music.

Advise caregivers to keep portions small and place foods on small plates to avoid overwhelming patients. Another tip is setting alarms every 2 to 3 hours as a reminder for their loved ones to eat. Caregivers can help by always having snacks packed so they are available when the alarm goes off. Even keeping items nearby at night so patients can eat whenever they happen to get hungry can be helpful.

Caregiving can take a toll, so it can be helpful to remind them that "it takes a village" and assist them in providing practical advice for friends and family who ask how they can help. Have patients and caregivers engage their whole team. If friends and family want to help and prepare foods, then providing lists of what the patient can tolerate is helpful. This will in turn reduce the amount of foods that might not be appealing, hard to digest, or have a strong odor. Have caregivers ask friends and family to date the foods with the day that it was prepared. That way, one can then gauge when it should be frozen or is past its prime. Friends and family can portion out meals into smaller containers to make things easier. Figure 2 has three recipes that are easy to make, easy to digest, high in protein, high in vitamins, and high in calories. These recipes may also appeal to a wide variety of tastes and palates.

CONCLUSION

Maintaining proper nutritional status is critical for patients diagnosed with pancreatic cancer. Patients need to be screened early and routinely to identify malnutrition and the risk for malnutrition. In addition to maintaining good nutrition, dehydration and EPI need to be recognized and treated. Symptoms from the disease itself or side effects from treatments can alter patients' nutritional intake and must be managed closely. Effectively maintaining nutrition and avoiding malnutrition involves comprehensive multidisciplinary care teams. Advanced practitioners are often at the forefront of day-to-day care. It is important

to collaborate with registered dietitians, patients, and caregivers on screening, re-screening, and addressing nutritional needs. Everyone on the team should be aware of the importance of maintaining proper nutrition for improved quality of life and better clinical outcomes, including overall survival.

While guidelines are lacking in recommendations specific for nutritional support for patients with pancreatic cancer, it is now recommended by the National Comprehensive Cancer Network Guidelines that all oncology patients be screened for palliative care at their initial visit and appropriate intervals after (National Comprehensive Cancer Network, 2025). Other guidance for the assessment and management of EPI and the management of symptoms that contribute to malnutrition, such as nausea and vomiting, can be incorporated to help guide best practices (Dominguez-Muñoz et al., 2025; Kennedy et al., 2024; Sande et al., 2019).

Even as guidelines and practices emerge, routine and proactive screening for the assessment and management of malnutrition will remain imperative to overall quality of life and adherence to treatment plans. Investigating the effects of nutritional interventions on patient quality of life and outcomes necessitates additional research. Furthermore, updating clinical guidelines is crucial to facilitate a whole-person approach to patient care. ●

Acknowledgment

The authors would like to thank the Canopy Cancer Collective, 1440 Foundation, for their financial support in the video creation and Double LL Productions, Michael Vogel, and Mark Mostad for the assistance in video production and editing of the supplementary educational video, available at <https://www.youtube.com/watch?v=eJ9E95IWbjY>.

The authors would also like to thank the McKnight Family Foundation. A big thank-you to Dr. Randy Danielsen, PhD, PA-C, Emeritus, DFAAPA, A.T. Still University, for continuous guidance, encouragement, and support.

Disclosure

The authors have no conflicts of interest to disclose.

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Peanut Butter Energy Mix

Servings: 2

Yield: 6 Tbsp

Serving size: 3 Tbsp

Calories per serving: 279 calories

Protein per serving: 11 grams

Ingredients

- 2.5 Tbsp protein powder
- 1 Tbsp honey
- 1 Tsp water
- 5 Tbsp nut butter
- 1 Tsp vanilla extract
- Optional additions: dark chocolate chips, oats, cinnamon, dried fruit

Directions

Mix protein powder with water and vanilla. Add honey and nut butter. Add water or protein powder as needed for consistency. Add any optional additions. Roll into balls or use as a dip or spread. Store in the refrigerator or you can also freeze them.



Protein Smoothies

Servings: 1

Yield: 12 oz

Serving size: 12 oz

Calories: 700–800 calories

Protein per serving: 30 grams

Ingredients

- 1 packet (1-2 oz) protein powder
- 1 cup high-protein milk
- 0.75 cup premium ice cream
- 1 Tbsp non-descript oil (extra-virgin olive oil, avocado oil, or canola oil)
- Fruit of your choice (bananas, melons, and/or canned fruit for easy digestion)

Directions

Blend all ingredients in a blender until smooth.



Hot Cocoa Drink

Servings: 1

Yield: 8 oz

Serving size: 8 oz

Calories: 600 calories

Protein per serving: 25 grams

Ingredients

- 0.5 cup half-and-half, warmed
- 0.5 cup whole milk, warmed
- 4 Tbsp chocolate syrup
- 2 Tbsp protein powder
- 2 Tbsp whipped cream

Directions

Add all ingredients to a blender and blend until smooth. Top with whipped cream.

Figure 2. Recipes. Adapted from Johns Hopkins Medicine Video Gallery.

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