

Post-COVID-19:**Nutrition for Recovery and Rehabilitation (Adults)***Applicable to: Nurses, Physicians, and Other Health Professionals***Recommendations**

Nutrition is an important part of recovery and rehabilitation post-COVID-19.

Evidence and best-practice supports a multidisciplinary team approach to managing a patients' care post-COVID-19.

Nutrition Needs of the Adult Patient Post-COVID-19**Calories, Protein, and Fluid**

- Adequate calorie and protein intake to maintain or optimize a healthy body weight and composition is recommended due to the highly individualized needs of the post-COVID-19 patient.
- A Registered Dietitian (RD) can assist with the individualization of the nutrition approaches to support the recovery and rehabilitation of the post-COVID-19 patient.
- Encourage a minimum of 9 – 12 cups (2.25 – 3 L) fluid daily for hydration.

Considerations

There are several important considerations related to the calorie and protein needs of the patient post-COVID-19, the complexity of which require individual assessment by an RD.

- Malnutrition and sarcopenia are regularly seen in patients following a critical illness, include post-COVID-19 infection. An increase in calorie and protein intake can help to prevent further wasting and support recovery.
- However, large increases in calories and/or protein is cautioned against to avoid burdening metabolic processes and cardiopulmonary demands.
- Post-COVID-19 nutrition-related side effects may present a challenge for patients to increase intake and should be considered when assessing each patient individually.

Common Post-COVID-19 Nutrition-Related Concerns

Manage active and post-COVID-19 related symptoms to achieve optimal nutrition status.

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Common Post-COVID-19 Nutrition-Related Side Effects

Malnutrition can be worsened by nutrition-related side effects.

- Early satiety and poor or loss of appetite
- Fatigue or low energy
- Difficulty swallowing (dysphagia)
- Loss of taste and taste changes
- Impaired or loss of smell
- Diarrhea and constipation
- Nausea and vomiting
- Unintentional weight loss

Malnutrition and sarcopenia are regularly observed in post-COVID-19 patients.

- For patients with ongoing weight loss who have difficulty consuming adequate nutrition over a prolonged period of time, alternative routes for nutrition (i.e. enteral nutrition) should be considered. Patients should be referred to an RD for assessment.

Malnutrition Screening Tools

- Screening for malnutrition and other common side effects of COVID-19 is recommended to improve or maintain nutrition status. The following nutrition screening tools are recommended in the following care settings:
 - *Acute inpatient or primary care:* Canadian Nutrition Screening Tool (CNST).
 - *Acute inpatient, long-term care, or supportive living:* Malnutrition Screening Tool (MST).
 - *Primary care, older adults:* Screen 8.
 - *Primary care, long-term care, supportive living, and home care:* Mini-Nutrition Assessment (MNA-SF).

[Additional Consideration for Patients Post-COVID-19](#)

Household Food Insecurity

- Social isolation, government lockdown orders, difficulties getting to a grocery store, or limited food choices in one's community can significantly impair a patient's ability to access foods.
- The ability to afford basic needs, including food, will impact patients' recovery. Screen patients and connect them to supports and services.

Mental Health

- The psychological and emotional states of patients' post-COVID-19 are particularly vulnerable, with depression and anxiety being commonly reported.
- Mental health problems significantly increase the risk of worsening the patient's nutrition status and impeding their recovery and rehabilitation.

Micronutrient Supplementation

At this time there is limited evidence to support the use of micronutrients to treat COVID-19 or support recovery post-COVID-19.

- If micronutrient deficiencies are clinically identified, supplementation to achieve ideal serum range is encouraged, but large quantities of micronutrients are not supported at this time.

Probiotics and Functional Foods

At this time there is limited evidence to support the use of probiotics and functional foods to treat COVID-19 infections or support recovery post-COVID-19.

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Introduction

The purpose of the *Post-COVID-19: Nutrition for Recovery and Rehabilitation Nutrition Guideline* is to provide health professionals with an overview of the evidence-based nutrition recommendations for adults following an active case of COVID-19 and to provide answers to commonly asked questions (See [Key Questions List](#)).

While comprehensive, this Nutrition Guideline (NG) will not include detailed information specific to:

- Patients with COVID-19 that are currently in hospital or community with an active disease state (positive COVID-19 test result);
- Enteral or parenteral nutrition for adult patients with COVID-19;
- Pediatric COVID-19 active disease state or long-term recovery or rehabilitation (<18 years of age).

This information is intended as a general resource only and is not meant to replace the medical counsel of a physician or individual consultation with a Registered Dietitian (RD). It is the responsibility of the health professional to evaluate the situation of each patient in their care and apply the NG appropriately. Individuals who are at high risk of malnutrition or who have a medical condition that are impacted by nutrition should receive RD assessment and intervention. See [Nutrition Guideline: Referral to a Registered Dietitian](#) for more information on how an RD can support your patient.

To learn how to connect with an RD in your AHS Zone, refer to the link below:

<https://www.albertahealthservices.ca/info/Page16475.aspx>

AHS [Health Link](#) also has RDs available to answer general nutrition questions. If your patient has a nutrition question, they can call 8-1-1 and ask to speak to a dietitian.

AHS [Rehabilitation Advice Line](#), toll free 1-833-379-0563, is available for patients to speak with an Occupational Therapist or Physiotherapist to receive self-management advice, education, and way-finding to in-person or virtual services. Patients' post-COVID-19 are encouraged to call to help support rehabilitation and recovery.

Note: For purposes of this NG, the single term patient will be used to refer to clients, patients, and residents.

Background

The NG was developed by the Nutrition Services Provincial Strategy team and is based on scientific evidence and best practice available as of publication date.

COVID-19 is a new illness, therefore, limited studies exist guiding the best approaches for post-COVID-19 recovery specifically. However, many of the known side effects and long-term effects of COVID-19 have been identified, and existing nutrition recommendations may be applied to support the recovery and rehabilitation of patients' post-COVID-19 infection.

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Post COVID-19: Nutrition for Recovery and Rehabilitation

Key Questions List

Key questions that are related to post-COVID-19 that are addressed in this NG are addressed below.

Nutrition Needs of the Adult Patient Post-COVID-19

- [What are the calorie needs for adult patient post-COVID-19?](#)
- [What are the protein needs for adult patient post-COVID-19?](#)
- [What are the hydration needs the adult patient post-COVID-19?](#)

Common Post-COVID-19 Nutrition-Related Concerns

- [Which post-COVID-19 nutrition-related side effects may increase nutrition risk?](#)
- [How does malnutrition affect my patient post-COVID-19?](#)
- [What tools exist to screen patients' post-COVID-19 for malnutrition?](#)

Approaches to Managing Post-COVID-19 Nutrition-Related Side Effects

- [What are the recommended nutrition approaches for managing early satiety and poor or low appetite?](#)
- [What strategies can help support my patient with fatigue or low energy?](#)
- [How can I support my patient with swallowing difficulties \(dysphagia\)?](#)
- [How can I support my patient with loss of taste/taste changes \(ageusia/dysgeusia\)?](#)
- [How can I support my patient with impaired or loss of smell \(anosmia\)?](#)
- [How can I help my patient manage post-COVID-19 nausea and vomiting?](#)
- [How can I support my patient with post-COVID-19 diarrhea and constipation?](#)
- [How can I support my patient post-COVID-19 with unintentional weight loss?](#)

Additional Consideration for Patients Post-COVID-19

- [How can I support my patient who is struggling to make ends meet?](#)
- [What are nutritional considerations for patients' post-COVID-19 related to mental health?](#)
- [What happens if my patient gains weight?](#)
- [What nutrition-related approaches require further evidence?](#)

Resources

- [What resources are available for healthcare providers?](#)
- [What resources are available for adult patients?](#)

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Post COVID-19: Nutrition for Recovery and Rehabilitation

Answers to Key Questions

Nutrition Needs of the Adult Patient Post-COVID-19

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An emphasis on the recovery and rehabilitation of post-COVID-19 patients is important due to the severity of the illness.¹ Nutrition plays a crucial role in recovery and rehabilitation post-COVID-19 to support health and overall quality of life.¹⁻³

The following section will answer questions related to:

- Calorie needs
- Protein needs
- Fluid needs

For patients' post-COVID-19 struggling with severe or multiple nutrition-related side effects, a referral to an RD is indicated.

What are the calorie needs of the adult patient post-COVID-19?

During an active COVID-19 infection, it is reportedly common for patients to experience severe inflammation and malnutrition secondary to side effects known to a COVID-19 infection.⁴ Specific calorie recommendations for the post-COVID-19 population are unknown at this time. Each patient's caloric needs are highly individualized based on:

- Severity of COVID-19 acute infection
- Existence of comorbidities
- Presence of ongoing side effects post-COVID-19 infection.

An appropriate caloric goal would be one that supports weight maintenance to ensure the patient is provided with adequate intake to support rehabilitation and recovery.

If the patient is unable to stabilize their weight while consistently achieving a higher caloric range, increase oral intake slowly to avoid metabolic risks.⁵

Nutrition Handouts: Refer to the [Nutrition Education Materials Webpage](#) for approved provincial Alberta Health Services handouts to support patient education.

- Refer to section *Higher Calorie and Protein*.

What are the protein needs of the adult patient post-COVID-19?

Patients who are post-COVID-19 infection are at a greater risk of malnutrition and sarcopenia.^{4,6,7} (i.e., low muscle mass and low muscle function).^{7,8} Sarcopenia can:

- Contribute to unintentional muscle wasting.⁹⁻¹¹
- Impact muscles throughout the entire body, including muscles required for swallowing and breathing.⁹

An increase in protein intake, as well as calories, is recommended for the post-COVID-19 patient to promote increase and maintenance of lean mass.^{5,12}

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Strategies that can be used to increase a patient's intake of protein foods include:

- Eat multiple times during the day.
- Include a protein source at each meal and snack.
- Puree pulses and legumes (lentils, beans, or peas) and add to soups, stews, or sauces.
- Add Greek or Icelandic yogurt, whey protein, ice cream, or milk to fruit smoothies.
- Melt cheese into soups, sauces, eggs, and casseroles.

Considerations

Important considerations related to protein for patients' post-COVID-19 include:

- Large increases in protein that result in rapid weight gain should be cautioned against to avoid burdening metabolic processes and cardiopulmonary demands.⁵
- Protein needs are highly individualized and physiologically impacted by the severity of acute-COVID-19 infection, resultant side effects post-COVID-19, and previously existing co-morbidities.
- Although protein intake is an important component of building and retaining muscle mass, evidence supports COVID-19 rehabilitation plans should include physical activity and fitness to assist with muscle anabolism.^{1,2,12,13} Immobility and physical inactivity secondary to a recent hospitalization, fatigue, and decreased respiratory capacity can make building and retaining muscle mass challenging.^{12,13}
- Weight and muscle loss (malnutrition) is regularly seen in patients following a critical illness and has been observed frequently in post-COVID-19 patients.^{1,5} An increase in caloric and protein intake can help to prevent further weight and muscle losses and aid with recovery.⁵
- Due to post-COVID-19 nutrition-related side effects, such as loss of taste and smell, increasing nutrition intake may present a challenge and should be considered when assessing each patient individually.⁷
- An increase in calories and protein can be helpful with recovery in some patients.^{4,5}

Nutrition Handouts: Refer to the [Nutrition Education Materials Webpage](#) for approved provincial Alberta Health Services handouts to support patient education.

- Refer to section *Higher Calorie and Protein*.

What are the hydration needs of the adult patient post-COVID-19?

Appropriate hydration prevents the morbidity and mortality risks associated with dehydration and overhydration.¹⁴ COVID-19 nutrition-related side effects that result in fluid loss, such as diarrhea or vomiting, or side effects that may inhibit fluid intake, like dysphagia, increase the risk of the dehydration.¹⁵ For most adults, consumption of a minimum of 9 – 12 cups (2.25 – 3 L) fluid daily is encouraged.¹⁵

- Estimation of fluid needs can be based on one or more of the following equations:
 - 30 mL/kg body weight (using actual body weight).¹⁴⁻¹⁶
 - 1 mL/kcal fluid for older adults.¹⁴
- Examples of beverages include water, milk, fruit juice, oral nutrition supplements, broth, sports drinks, coffee, and tea.
- Typically, light yellow urine passed every 3-4 hours is indicative of adequate hydration status.
- Drink $\frac{1}{4}$ – $\frac{1}{2}$ cup (60 – 125 mL) every 15 minutes if larger amounts of fluids are overwhelming or difficult for the patient to consume.

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Considerations

Important considerations related to fluid for the post-COVID-19 patient include:

- Oral nutrition supplements can be used to meet fluid requirements and aid in increasing calories and protein in the post-COVID-19 patient.¹⁷
- Individual needs may vary based on cardiac, hepatic, and renal disease.^{14,15}

Nutrition Handouts: Refer to the [Nutrition Education Materials Webpage](#) for approved provincial Alberta Health Services handouts to support patient education.

- Refer to section *Healthy Eating*

Common Post-COVID-19 Nutrition-Related Concerns

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The following section will answer questions related to:

- Post-COVID-19 nutrition-related side effects that may increase nutrition risk.
- How malnutrition impacts recovery and rehabilitation post-COVID-19.
- Screening that can be completed to identify patients at risk for malnutrition.

Which post-COVID-19 nutrition-related side effects may increase nutrition risk?

Numerous nutrition-related side effects have the potential to be experienced by patients' post-COVID-19. Common nutrition-related side effects that patients may experience post-COVID-19 include:

- Early satiety and poor or loss of appetite^{10,18}
- Fatigue or low energy^{1,6,10}
- Difficulty swallowing (dysphagia)^{1,2,12,19}
- Loss of taste/taste changes (ageusia/dysgeusia)^{10,12,20–22}
- Impaired or loss of smell (anosmia)^{10,20–22}
- Bowel changes: diarrhea^{20,23–25} or constipation^{24,25}
- Nausea²⁴ and vomiting^{23,24}
- Unintentional weight loss^{4,9}
- Malnutrition^{2,7,18,26}

These side effects may impair a patient's ability to achieve adequate nutrition intake and may contribute to malnutrition.

How does malnutrition affect my patient post-COVID-19?

Malnutrition is a condition characterized by the significant loss of muscle mass as a result of decreased caloric and/or protein intake or from effects of disease.^{10,27} Malnutrition prior to the COVID-19 pandemic was already a significant problem in Canada. In Alberta, approximately 50% of adult patients admitted to hospital are already malnourished.²⁷ Malnutrition increases the length of stay in hospital and increases the risk of hospital readmission.^{27,28} COVID-19 patients, particularly those who were hospitalized in critical care, experience significant weight and muscle loss and should be treated, routinely assessed, and referred appropriately for malnutrition.^{2,4,26}

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Post-COVID-19 patients are commonly plagued by side effects that make activities of daily life and physical activity significantly challenging. These include:

- reduced lung capacity or chronic lung damage²⁹
- extreme fatigue²⁹⁻³¹
- bedrest during infection³⁰
- poor oral intake¹¹
- reduced physical capacity³¹
- sedentary impact of quarantine³¹

These side effects can all result in malnutrition.^{11,32}

COVID-19 nutrition-related side effects can contribute to a decline in muscle growth and regeneration (sarcopenia) and when combined with systemic inflammation common in COVID-19 patients, can further increase the risk for malnutrition.³²

To learn more about malnutrition in Canada, visit the [Canadian Malnutrition Task Force](#) or the [Canadian Nutrition Society](#).

What tools exist to screen my patients for malnutrition?

Evidence supports that nutrition risk in hospital is associated with severe COVID-19 infections and prognosis.⁹ Screening is recommended throughout transitions across the healthcare continuum to promote early identification of malnutrition or ongoing symptoms which may impact nutrition status. Screening often and as patients transition through the healthcare system for malnutrition can help to identify worsening or changes in nutrition status to promote the patient's rehabilitation and recovery.^{18,33,34}

Validated nutrition screening tools commonly used to identify patients at risk for malnutrition include:

- [Canadian Nutrition Screening Tool \(CNST\)](#)
- [Malnutrition Screening Tool \(MST\)](#)
- [Screen 8](#)
- [Mini-Nutritional Assessment \(MNA-SF\)](#)

Screening in Primary Care Settings

The CNST is indicated for use in primary care,³⁵ is easy to conduct with patients, and is the preferred nutrition screening tool in use in most AHS facilities in Alberta. The CNST is the screening tool integrated into Connect Care in Alberta. The CNST consists of two questions to identify the risk of malnutrition and assist the healthcare practitioner with determining when to refer to an RD. The CNST questions are:

1. Have you lost weight in the past 6 months without trying to lose this weight?*
2. Have you been eating less than usual for more than a week?
 - Two "yes" answers indicate a nutrition risk.
 - *If the patient reports a weight loss but gained it back, consider it as no weight loss.³⁶

Screen 8,³⁷ historically referred to as Screen II, consists of 8 questions and is validated for use with older adults to identify nutrition risk. Screen 8 is an alternative nutrition screening tool available for healthcare practitioners to use.

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Screening in Hospital and Primary Care Settings

Malnutrition Screening Tool (MST) is a validated tool for use in both acute and ambulatory settings.^{38,39} The MST is typically conducted on admission by nursing and used to determine nutrition risk and generate an RD referral.

Screening in Long Term Care, Supportive Living, and Home Care Settings

The Mini-Nutritional Assessment – Short Form (MNA-SF) is also validated for use in the older adult population and is more frequently used in Long Term Care and Supportive Living facilities, as well as in Home Care.⁴⁰ The MNA-SF consists of 6 questions and provides a scoring grid to aid the healthcare practitioner with nutrition risk assessment.

Positive Malnutrition Screens

When a patient is identified at risk for malnutrition, a referral to an RD is recommended for further assessment and follow-up.

Approaches to Managing Post-COVID-19 Nutrition-Related Side Effects

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Nutrition approaches for managing common post-COVID-19 nutrition-related side effects that will be reviewed are outlined below:

- [Managing early satiety and poor or low appetite](#)
- [Supporting patients experiencing fatigue or low energy](#)
- [Managing swallowing difficulties](#)
- [Supporting patients with loss of taste or taste changes](#)
- [Supporting patients with impaired or loss of smell](#)
- [Managing nausea and vomiting](#)
- [Managing gastrointestinal changes: diarrhea and constipation](#)
- [Supporting patients who are experiencing unintentional weight loss](#)

Complementary resources for healthcare providers and patients can be found under the [Resources](#) section at the end of this NG.

What are the recommended nutrition approaches for managing early satiety and poor or low appetite?

Patients may experience sensations of getting full quickly when eating or drinking post-COVID-19. They may also report that they are unable to eat as much as they did prior to getting COVID-19.¹⁰ Given that appetite is subjective and can be difficult to measure,⁴¹ the most practical approach to assessing changes may be to compare a patient's post-COVID-19 appetite to their pre-illness feelings of hunger, fullness, and satiety.

Patients may also be experiencing a poor or total loss of appetite post-COVID-19 infection, either concurrently or alternatively to early satiety.⁴ Adequate nutrition is an important component of recovery and rehabilitation for post-COVID-19 patients.^{4,9} However, when appetite or satiety is impaired, achieving adequate nutrition may be challenging.¹⁰

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Strategies that patients can use to optimize the nutrition content of meals and snacks include:

- Eat larger amounts when feeling well.
- Consume fluids away from meals to avoid filling up too quickly.
- Try 6 smaller meals spread throughout the day.
- Snack every 2 to 3 hours, even when they don't feel hungry.
- Add oral nutrition supplement drinks, bars, or puddings to meals and snacks.
- Limit foods and fluids that have low nutrition content, such as foods or fluids labelled: "light", "low fat", "low calorie", or "sugar-free".

Nutrition Handouts: Refer to the [Nutrition Education Materials Webpage](#) for approved provincial Alberta Health Services handouts to support patient education.

- Refer to sections *Higher Calorie and Protein* and *Healthy Eating*.

What strategies can help support my patient with fatigue or low energy?

Fatigue is a commonly reported side effect by post-COVID-19 patients.¹⁰ Patients who were hospitalized for post-COVID-19 have been observed to have:

- low lung volume^{2,10}
- reduced capacity for physical exertion^{2,10}
- experienced muscle wasting^{2,10}
- psychological disorders^{7,42}

Each of these clinical COVID-19 side effects can negatively impact the patient's energy level.¹ Degree and duration of fatigue will vary between patients.¹ Fatigue secondary to a COVID-19 infection has been described as "profound" and persisting long after the COVID-19 infection has cleared.⁶

Eating, drinking, and meal preparation are energy-consuming activities and could potentially require more physical energy and effort than the patient is able to exert. The mere act of chewing can exhaust a patient with extreme fatigue. Chronic fatigue can impact how well a patient is able to nourish themselves and increases the risk of malnutrition.⁶ Nutrition interventions are aimed at preventing malnutrition and muscle wasting as research has not provided evidence that nutrition will improve post-COVID-19 related fatigue.^{6,10}

Practical strategies that patients can use to reduce energy expenditure during meal preparation and eating include:

- Eat 6 smaller meals throughout the day.
- Use adaptive tools, such as a pizza cutter instead of a regular knife.
- Finger foods may be easier to manage instead of using cutlery.
- Modify food textures to reduce energy exerted through chewing.
- Oral nutrition supplements or shelf-stable snacks can be spread throughout the home in locations the patient frequents.¹⁰ This allows the patient to readily access nutrition without having to walk room-to-room which may be tiring.
- Reheat ready-made foods prepared by family, friends, or meal delivery services.
- If the patient has family or friends they can depend on, suggest that ready-made meals be frozen for the patient to allow for reheating. Alternatively, meal delivery programs such as Meals on Wheels™ may be accessed for short or long-term use.

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Extreme fatigue will impact the patient's ability to acquire, prepare, and consume foods or fluids. This severity of fatigue can also greatly increase the patient's risk of malnutrition. Should your patient experience this level of fatigue, a referral to an RD should be completed with urgency. See the [Nutrition Services](#) webpage for how to access an RD in your zone.

Nutrition Handouts: Refer to the [Nutrition Education Materials Webpage](#) for approved provincial Alberta Health Services handouts to support patient education.

- Refer to sections *Healthy Eating* and *Higher Calorie and Protein*.

How can I support my patient with swallowing difficulties (dysphagia)?

Dysphagia is caused when there is a problem with the swallowing mechanisms (neurological, muscular, or of an unknown etiology) which impairs the patient's ability to protect their airway.^{43,44} Dysphagia presents a significant nutrition and safety risk to the patient.⁹

Dysphagia may be experienced in patients' post-COVID-19 who were intubated, tube fed, or who lost a significant amount of muscle mass during their COVID-19 infection.¹ Patients with dysphagia are at a greater risk of:

- Malnutrition^{9,10,45}
- Sarcopenia⁹
- Aspiration pneumonia^{44,45}
- Respiratory infections¹
- Dehydration⁴⁵
- Impaired quality of life¹⁰
- Social isolation¹⁰
- Death⁴⁶

The COVID-19 virus has a severe impact on the respiratory system.¹ As such, the patient should be strongly encouraged to follow recommendations for safe swallowing due to the high risk of pneumonia and respiratory infections related to aspiration of food, saliva, or fluid.⁴⁵

Post-COVID-19 patients who were previously hospitalized and experience dysphagia may have already been assessed by a Speech Language Pathologist (SLP). An SLP will be able to determine, via bedside swallow assessment or videofluoroscopy (or modified barium swallow), the safest and most appropriate texture and/or fluid consistency for the patient. An Occupational Therapist (OT) can assess the patient for adaptive tools, such as nose cups, to assist with the intake of food and fluids if required by the patient. The dysphagia team (SLP, OT, and RD) should be involved with patients with swallowing difficulties to support health and safety.

Patients who were hospitalized for a severe COVID-19 infection and required enteral or parenteral nutrition are at greater risk for dysphagia post-infection.¹⁹ If the post-COVID-19 patient is struggling to consume adequate nutrition orally or if dysphagia is severe making oral intake unsafe, alternative sources of nutrition should be considered.^{17,19,47} Research indicates that post-ICU patients consume less than 50% of their protein and caloric needs orally 3-months following hospital discharge.⁴⁸⁻⁵⁰ Based on the extent and severity of dysphagia, enteral nutrition may only be required for short-term use while the patient recovers, however, this is largely individualized. Safety and nutrition risk are important factors in this decision. A multidisciplinary and patient-centred approach involving the dysphagia team is recommended.

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Patients deemed safe for oral intake should be encouraged to:

- Engage in regular mouth care to control oral bacterial growth which may increase the risk of pneumonia should the patient aspirate food, fluids, or saliva.
- Maintain good posture (as close to a 90-degree angle upright as possible) during and at least 30 minutes following completion of the meal or snack. This reduces aspiration risk.
- Limit distractions while consuming foods or fluids such as watching TV, reading, or talking.
- Consume foods in the appropriate textures recommended by the dysphagia team – if applicable.
- Consume fluids in the appropriate consistency recommended by the dysphagia team – if applicable.
- Consider alternate feeding route such as enteral nutrition when safe oral intake cannot be maintained.

If dysphagia is significant or worsens, a referral to an SLP for reassessment should be considered to determine if a change in texture modified diet or fluid consistency would enhance the patient's safety and quality of life. Regular follow-up assessments with the dysphagia team (SLP, OT, and RD) is encouraged due to the significant clinical, physiological, and emotional impacts of the condition.

Nutrition Handouts: Refer to the [Nutrition Education Materials Webpage](#) for approved provincial Alberta Health Services handouts to support patient education.

- Refer to sections *Dysphagia* and *Higher Calorie and Protein*.

AHS Nutrition Guidelines: Provides nurses, physicians, and other healthcare professionals with consistent evidence-based messaging for key nutrition topics.

- Refer to *Nutrition Guideline: Dysphagia* or *Nutrition Guideline: Seniors Health Overview (65 years and older)* for in-depth information on these topics.

How can I support my patient with loss of taste/taste changes (ageusia/dysgeusia)?

Ageusia (total absence of taste) and dysgeusia (change in taste) are common side effects of the neurological impact of COVID-19,^{20,22} and, for some patients, persists after recovery from COVID-19.²¹ The degree of loss or type of taste change is highly individualized.²² Ageusia and dysgeusia can take the pleasure out of eating or deter the patient from consuming foods or fluids. This can put the patient at an increased risk for malnutrition. Lack of taste or taste changes greatly enhances the need for being diligent about food safety as the patient will be unable to use taste as a determinant of food spoilage.^{17,22}

Nutrition strategies for patients experiencing loss of taste or taste changes include:

- Encourage patients to monitor expiration dates on foods and fluids and dispose of any items past-due or that appear to have spoiled.
- Regular mouth care can make taste changes more acceptable. Brush teeth and tongue or rinse mouth well before and after each meal. Wait 10-15 minutes after mouth care before eating.
- If the patient is struggling with most foods and fluids, oral nutrition supplements can be recommended to supplement oral intake to support their nutrition and fluid status.¹⁷

Due to the potential decreased enjoyment of food that comes with impaired or lack of taste, the patient may experience negative social impacts.¹⁰ Meals are often enjoyed with others and the change in this dynamic may further a risk of a decline in mental health. Recommend discussing referral to a mental health practitioner with the patient to offer support. See the [mental health](#) section for more details.

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Nutrition Handouts: Refer to the [Nutrition Education Materials Webpage](#) for approved provincial Alberta Health Services handouts to support patient education.

- Refer to sections *Cancer* (for resources on sensory changes), *Higher Calorie and Protein*, and *Dysphagia*.

How can I support my patient with impaired or loss of smell (anosmia)?

Olfactory dysfunction by way of loss of smell continues to persist in some post-COVID-19 patients and is highly individualized to the extent of which each patient is affected.^{20,21} Nutrition strategies and recommendations are aimed at working with anosmia by encouraging consumption of foods or fluids that appeal to the patient, either by texture, taste, or the memory of previous experiences with the food. Food safety practices should be encouraged to reduce the risk of food poisoning secondary to anosmia preventing the patient from smelling spoiled or expired foods.^{17,20}

Nutrition strategies for anosmia to encourage oral intake:

- Encourage patients to monitor expiration dates on foods and fluids and dispose of any items that are past-due or that appear to have spoiled.
- Prepare foods that you can experience in other ways, such as through taste, mouthfeel, or crunch.

See section [loss of taste/taste changes \(ageusia/dysgeusia\)](#) for patient resources related to anosmia.

How can I help my patient manage post-COVID-19 nausea and vomiting?

Nausea can occur for different reasons.⁵¹ When the patient has nausea, encourage them to eat what they can tolerate and what appeals to them. If their nausea is short-term or intermittent, the patient will be able to resume their regular eating pattern once their nausea is alleviated. However, when nausea is chronic, additional interventions may be necessary⁵¹ as it can impose an increased risk of malnutrition.

Nausea

Some strategies that can be used to support intake when patients are experiencing nausea include:

- Eat slowly to prevent filling the stomach too quickly.
- Eat smaller meals and snacks spread throughout the day.
 - An empty stomach can make nausea worse.
- Drink fluids at least 30 – 60 minutes before or after meals to optimize oral intake.
- A straw (if dysphagia is not present) can be used if the smell is too strong.
- Try cold or room temperature foods as they tend to be less aromatic.
- Cook meals outdoors or open windows when preparing food.
- Try foods that do not require cooking such as sandwiches, milkshakes, vegetables with dip, and crackers and cheese.
- Ask family members or friends to prepare freezer meals to reduce cooking smells at home.
 - Meal delivery services are available in some locations, such as Meals on Wheels™ or Heart to Home Meals™.

Considerations

Holistic approaches to nausea may include:

- Pharmacological: anti-nausea or anti-emetic medication(s).⁵¹
- Complementary treatments such as acupuncture or acupressure⁵² and ginger.⁵³

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Vomiting

Strategies that can be used to support oral intake when patients are experiencing vomiting (emesis) include:

- Avoid solid foods if vomiting.
- Sip on clear fluids every 15 – 30 minutes after vomiting to help replenish lost fluids.
 - Ideal daily fluid intake is 9 – 12 cups (2.25 – 3 L) when the patient feels better.
 - Clear fluids include water, broth, flavoured gelatin, ice pops, regular or diluted juice or sports drinks (non-caffeinated).
- Try a small amount of bland foods once vomiting has stopped. These include crackers, canned or cooked fruit, mashed potatoes, oatmeal, and white bread, rice, and pasta.

Persistent nausea and emesis puts the patient at risk of malnutrition and should be investigated by their physician and healthcare team.

Nutrition Handouts: Refer to the [Nutrition Education Materials Webpage](#) for approved provincial Alberta Health Services handouts to support patient education.

- Refer to sections *Gastrointestinal*, *Higher Calorie and Protein*, or *Healthy Eating*.

How can I support my patient with post-COVID-19 diarrhea and constipation?

Bowel changes, including diarrhea and constipation, may be experienced by post-COVID-19 patients due to:

- Antibiotic use⁵⁴
- Decreased mobility, i.e. associated with fatigue and quarantine requirements
- Reduced fluid or fibre intake (refer to [NG: Constipation](#))
- Stress⁵⁵
- Medication side effects²⁵

Post-COVID-19 patients who have cognitive impairments, for example, patients with dementia or that have “brain fog” like symptoms²⁵ are at an increased risk of constipation or diarrhea-related dehydration⁵⁴ due to the potential to forget to eat or drink.²⁵ If cognitive impairments are also present along with other risk factors listed above, the risk of negative bowel changes increases.²⁵

Fibre is a nutrient that provides bulk to stools, helps to make stools soft, and overall easier to pass.^{56,57} Fibre is the indigestible part of plant foods and an important nutrient for bowel health.^{56,57} Fibre is found in whole grains, nuts and seeds, fruits and vegetables, and legumes and pulses (beans, peas, and lentils).^{56,57} The amount of fibre recommended for age and gender can be found in *Table 1*.

Table 1. Fibre Needs in Grams per Day⁵⁸

| Age or group | Men (grams per day) | Women (grams per day) |
|---------------|---------------------|-----------------------|
| 19 – 50 years | 38 | 25 |
| Over 50 years | 30 | 21 |
| Pregnant | - | 28 |
| Breastfeeding | - | 29 |

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Diarrhea

Nutrition strategies for managing diarrhea include:

- Consume adequate fluids of at least 9 – 12 cups (2 – 3 L) daily to prevent dehydration (see the section: [What are the hydration needs of the post-COVID-19 adult patient?](#)).
- Avoid drinking caffeinated drinks like coffee, tea, and pop as they can increase peristalsis potentially worsening diarrhea.
- Drink small amounts of fluids throughout the day.
- Limit sugar alcohols, such as those found in sugar-free chewing gum and candy, which draw fluid into the bowel and their use should be cautioned against in people with pre-existing diarrhea.
- Eat foods that are higher in soluble fibre. Soluble fibre helps to gel the stool making it thicker. Foods that are high in soluble fibre include apples, applesauce, avocado, legumes such as beans and lentils, oatmeal, potatoes, and psyllium.
- Enteral nutrition results in loose stools or diarrhea in the COVID-19 population.²⁵ Refer the patient to an RD if loose stools persist beyond the initiation of an oral intake.

Constipation

Nutrition strategies for managing constipation include:

- Include fibre foods, both soluble and insoluble, at meals and snacks. Insoluble fibre does not dissolve in fluid and serves to add bulk and increase transit time of the stool in the bowel. Increase fibre foods slowly to allow bowels to get used to the increase in fibre to prevent gas and bloating.
- Add 1 – 2 tablespoons (15 – 30 mL) of wheat bran or ground flaxseeds to foods.
- Enjoy nuts and seeds in ¼ cup (60 mL) portions.
- Eat 7 – 10 servings of a variety of fruits and vegetables daily.
- Consume adequate fluids of at least 9 – 12 cups (2 – 3 L) daily to prevent dehydration (see the section: [What are the hydration needs of the post-COVID-19 adult patient?](#)).
- Support the patient with the development of a light exercise program.²⁵ Refer to a physiotherapist or kinesiologist if safety concerns are present.

Considerations

The following holistic recommendations can be applied for post-COVID-19 patients experiencing bowel changes:

- Pelvic floor physiotherapy may be beneficial in the post-COVID-19 patient²⁵ for muscle rehabilitation to support bowel regularity.
- Stress alleviating activities based on the patient's preferences and lifestyle.²⁵

Whenever possible, prevention should be encouraged before diarrhea or constipation become a problem for the patient.^{56,57} Adequate fluid and fibre intake, physical activity, and stress management is encouraged.^{56,57}

Nutrition Handouts: Refer to the [Nutrition Education Materials Webpage](#) for approved provincial Alberta Health Services handouts to support patient education.

- Refer to sections *Gastrointestinal* and *Healthy Eating*.

AHS Nutrition Guidelines: Provides nurses, physicians, and other healthcare professionals with consistent evidence-based messaging for key nutrition topics.

- Refer to [Nutrition Guideline: Fibre](#) and *Nutrition Guideline: Constipation* for in-depth information on these topics.

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How can I support my patient post-COVID-19 with unintentional weight loss?

Both intentional and unintentional weight loss in the post-COVID-19 patient should be avoided due to the increased need for calories and nutrition to support recovery and rehabilitation.^{4,5} Many of the nutrition-related side effects reviewed in this NG can result in unintentional weight loss or malnutrition if the side effect significantly impacts oral intake.

Sarcopenia, defined by low muscle mass, strength, and function,^{7,8,32} contributes to unintentional muscle wasting.^{9,10} COVID-19-induced sarcopenia has been reported in patients with an active moderate to severe infection.^{11,32}

Sarcopenia can occur in all body sizes which poses a difficulty for assessment in the community. Sarcopenic obesity is the loss of muscle and associated functions experienced by someone with a larger body size or someone living with obesity. Due to a pre-existing larger body size, unintentional weight loss may be difficult to observe by patient and practitioner. However, unintentional weight loss post-COVID-19, regardless of the initial weight of the patient, needs to be assessed and investigated as weight loss would be predominately muscle loss, and may indicate malnutrition or other clinical manifestations of disease or illness.³²

Use of anthropometric measuring equipment such a dynamometer used to measure hand-grip strength is one community-based test that could be implemented to measure loss or gain of muscle in post-COVID-19 patients.¹¹

Guidance on the percentage of weight loss and grading for severity is outlined in *Table 2*. Body weight can fluctuate daily (for example, due to fluid changes). However, an overall downward trend of body weight should be cautioned against in favour of weight maintenance.

Table 2. Evaluation of Body Weight Change Percentage⁵⁹

| Duration | Significant Weight Loss | Severe Weight Loss |
|----------|-------------------------|--------------------|
| 1 week | 1 – 2% | greater than 2% |
| 1 month | 5% | greater than 5% |
| 3 months | 7.5% | greater than 7.5% |
| 6 months | 10% | greater than 10% |

Various conditions affect weight changes. These include certain medications,³⁸ ascites,⁶⁰ edema,⁶⁰ dehydration,⁶¹ and large tumour growth⁶⁰ can mask the loss of fat mass or muscle tissue.⁶² The healthcare practitioner should assess for the suspected cause of weight loss in order to best support the patient. For example, weight loss that is secondary to dysphagia or a loss of appetite may be approached with strategies outlined in this NG. However, if the patient's intake is assessed to be adequate and unintentional weight loss continues despite interventions, further investigations into clinical causes are warranted.

If your patient is losing weight unintentionally, an RD will be able to assist upon referral. See the section on [How can I screen my patients for malnutrition?](#) for more information.

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Additional Considerations for Patients' Post-COVID-19

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Additional considerations for patients' post-COVID-19 infection are outlined below:

- [Supporting patients experiencing poverty, food access concerns, and household food insecurity](#)
- [Supporting patients with mental health concerns](#)
- [How to approach unintentional weight gain post-COVID-19](#)
- [Nutrition approaches requiring further evidence:](#)
 - micronutrient supplementation
 - probiotics and functional foods

How can I support my patient who is struggling to make ends meet?

Attention to the impact post-COVID-19 infection has on food access and financial strain leading to household food security are important considerations in the recovery process from COVID-19.

Food Access

Social isolation, government lockdown orders, difficulties getting to a grocery store, or limited food choices in one's community can significantly impair the patient's ability to access foods.^{63,64}

- Link patients to services that assist with delivering groceries directly to their home.
- Connect the patient to programs available in their community that can help with getting to and from grocery stores.
 - 211 Alberta is a provincial directory for programs and services.
 - Options to contact 211 are:
 - by phone or chat: dial 2-1-1
 - text INFO to 211
 - visit ab.211.ca and click "live chat"
 - Your community may also have a separate resource list.
 - Meal delivery programs may be available in your community:
 - Meals on Wheels™ is available in select cities in Alberta. Provides hot or frozen meals on a subsidized sliding scale.
 - Heart to Home Meals™, available for older adults residing in select locations in Alberta.

Financial strain: Household food insecurity

When households experience financial or income strain, food and medications are the first expenses to be compromised.⁶⁵⁻⁶⁷ Households may decrease the amount and quality of the food they buy.^{65,66} This is because other basic needs, such as rent and utility are fixed costs; households make sure these payments are made first.⁶⁷

As part of your clinical assessment, you are encouraged to assess the patient's financial status. It will affect your health recommendations on nutrition and medication.

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What to do:

1. Acknowledge that healthy eating is not affordable for many people. Guide conversations and actions that reflect the understanding that food insecurity is an income issue.^{66,67}
 - a. Screen all patients using the poverty-screening question: “Do you (ever) have difficulties making ends meet?”
2. If your patient responds yes to the poverty screening question:
 - a. Work together with your team to inform and help connect the patient to income-related programs and services. The [Poverty: A Clinical Tool for Primary Health Providers](#) outlines benefits that the patient may be eligible for.
 - i. 211 Alberta is the best provincial site for information on financial benefits and programs. Options to contact 211 are by phone, text or chat: dial 2-1-1, text INFO to 211 or visit ab.211.ca and click “live chat”
 - ii. Health and diet-related benefits, such as special diet and emergency food funding, may be available.
 - iii. Emergency food programs (e.g. food banks) can provide temporary relief. However, do not assume all patients will benefit or feel comfortable with using these programs. Patients may not access these programs due to barriers such as transportation, hours of operation, cultural appropriateness, and perceived stigma from using the services.^{67,68} In addition, many emergency food programs have restrictions on eligibility and how often they can be accessed.
 - If your patient wishes to access emergency food programs, assist them with the referral process.
 - b. Determine if the patient will benefit from a referral to social work (e.g. help with getting personal identification documents, benefits navigation).
 - c. Provide nutrition care based on the patient’s unique needs and circumstances.

It is important to have the patient lead the discussion about what matters to them and work in partnership to identify possible solutions. Respect that your patient’s most pressing priority may not be nutrition. Understand that healthy eating will be more possible once other needs are addressed.

AHS Nutrition Guidelines: Provides nurses, physicians, and other healthcare professionals with consistent evidence-based messaging for key nutrition topics.

- Refer to [Nutrition Guideline: Household Food Insecurity](#) and [Household Food Insecurity in Alberta: A Backgrounder](#) for in-depth information on these topics.

What are nutritional considerations for patients’ post-COVID-19 related to mental health?

COVID-19 has significant potential to negatively influence the psychological and emotional states of patients.^{7,42} Depression and anxiety are common amongst patients post-COVID-19.⁷ The following factors may contribute to these mental disorders:

- Post-intensive care unit (PICU) syndrome including post-traumatic stress disorder (PTSD)⁶⁹
- Survivor guilt⁶⁹
- Neurological impacts of the disease⁴²
- Loneliness⁷
- Social isolation^{42,64,70}

Each of these factors, which influence mental health, also come with a significant risk of worsening the patient’s nutrition status and impeding their recovery and rehabilitation.

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Mental health problems can affect patients differently, e.g. loss of interest in eating and worsening nutrition intake.⁷¹ Alternatively, preference for low nutrient, calorically dense foods,³ which can also negatively impact health, and in some patients, may cause undesirable weight gain, may also be exhibited.

A multidisciplinary approach to care is encouraged to support patients' post-COVID-19.^{7,69} Psychological or mental health counselling is an important component of the multidisciplinary team and should be promoted to patients experiencing depressive-or anxious-symptoms.⁴² For more support, visit the AHS [Mental Health Resources](#) webpage.

What happens if my patient gains weight?

Evidence supports that people in larger bodies or with diagnosed obesity prior to COVID-19 have a greater risk of worse outcomes of acute infection.⁷² At the time of publication, evidence in post-COVID-19 weight gain is limited and encompasses people who experienced COVID-19 to a lesser severity. Weight gain post-COVID-19 tends to be associated with a change in eating patterns, stress, and mental burden, as well as reduced physical activity secondary to quarantine and governmentally mandated physically-distancing measures,⁷³ rather than resultant directly from COVID-19.⁷⁴

Patients experiencing unintentional weight gain secondary to COVID-19, directly or indirectly, may benefit from referral to an RD or to other interdisciplinary team members, such as mental health, to offer support and profession-specific counselling.

What nutrition-related approaches require further evidence?

COVID-19 is a new virus and nutrition approaches to recovery and rehabilitation are being investigated. However, at the time of publication, the following approaches to nutrition care for the post-COVID-19 patient require further investigation to determine safety, effectiveness, as well as short-and long-term outcomes on patient health and disease status.

Please note, individual patient assessment and relevant medical history should be considered when determining if supplementation is required.

Micronutrient Supplementation

Specific micronutrients are being investigated in regards to the impact they may have on the inflammatory nature of the COVID-19 virus.⁴ At the time of publication, studies guiding the use of certain micronutrient supplementation, including vitamin C,^{75,76} vitamin D,^{4,75,76} selenium,^{75,76} and zinc,⁷⁵⁻⁷⁷ to support recovery and rehabilitation from COVID-19 are inconsistent in findings and recommendations.^{2,18}

AHS supports Health Canada's recommendation for supplementation with vitamin D across the lifespan for general health and adequacy.⁷⁸ Recommendations are based on age and life stage, range between 400 IU – 800 IU.⁷⁹ Specific recommendations for supplementation are located on Health Canada's website: [What Are the DRIs for Vitamin D?](#)

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Micronutrient deficiencies are often observed in malnourished patients.¹⁸ AHS Nutrition Services supports providing micronutrient supplementation to remedy clinical deficiency if a deficiency is present. This is to ensure safety and risk reduction of the patient as the effects of supplementation levels above the daily recommended intake (DRI) on the post-COVID-19 patient is unknown.

Due to the lack of evidentiary consensus, predominately due to the inability to conduct longitudinal studies as per the newness of COVID-19, supplementation beyond basic serum correction is discouraged at this time.²

Probiotics and Functional Foods

Probiotic bacteria, or probiotics, are being studied for the potential application to COVID-19 related diarrhea and overall immune function.⁵⁴ Different strains of probiotics and regimes are indicated for use in diarrhea of varying aetiologies as well as for the support of the immunological system in humans.⁸⁰

Microbial dysbiosis may result from antibiotic usage, particularly if the patient had received large doses of antibiotics to treat sepsis or other infections during their active COVID-19 infection or had been receiving antibiotics long-term either before or after COVID-19.⁸¹

Animal studies are showing promise with the use of probiotics on COVID-19-related diarrhea, however, outcomes in human trials for COVID-19 are yet to be supported.⁵⁴

Existing research on the use of probiotics to support clinical outcomes for respiratory (gut-lung axis) and gastrointestinal illnesses and conditions has illustrated the various beneficial properties of probiotics in improving the intestinal microbiota.⁸⁰ Evidence supporting probiotic use with COVID-19 diarrhea is inconsistent in regards to which probiotic strain is beneficial⁵⁴ and in which dosage and regime is preferential. The lack of evidence for probiotic usage with the COVID-19 virus includes diarrhea associated with antibiotic use, and during or post-infection in respect to immune-support and viral protection.¹⁷

Due to the infancy and dearth of research, recommendations for probiotic use in COVID-19, AHS Nutrition Services are unable to promote usage of specific strains of probiotics that would improve recovery or rehabilitation of the post-COVID-19 patient.

AHS Nutrition Services recommends consumptions of foods and beverages which have naturally occurring probiotic bacteria such as yogurt, kefir, or sauerkraut for general health. The consumption of these foods in regards to specific applicability to COVID-19 rehabilitation cannot be promoted at this time.

Functional foods containing prebiotic dietary fibre and probiotic bacteria may have a role in supporting the immune response in viral respiratory infections, such as COVID-19.^{75,81} Examples of functional foods include fatty fish such as salmon, legumes, unsalted nuts, olive oil, whole grains, berries, and vegetables.^{75,82} Functional foods may provide support to the immune system through the active ingredients or how they respond when consumed within the whole food. Evidence does not exist to support that functional foods can boost the immune system adequately to either prevent or provide recovery or rehabilitation from a COVID-19 infection.⁷⁵ Consumption of foods within the functional foods umbrella are encouraged to be enjoyed by the post-COVID-19 patient for overall health and nutrition. Promotion of functional foods in regards to boosting the immune system and supporting recovery for post-COVID-19 is not indicated at this time.⁷⁵

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Resources

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The following resources are provided to guide both healthcare providers and patients to reliable sources of information to complement the recommendations and resources outlined in this NG.

What resources are available for healthcare providers?

Available on the AHS website:

- [AHS Nutrition Guidelines](#)
 - [Constipation](#)
 - [Dysphagia](#)
 - [Fibre](#)
 - [Frailty, Nutrition Risk and Malnutrition in Seniors \(65 years and older\)](#)
 - [General Healthy Eating for Children and Adults](#)
 - [Heart Healthy](#)
 - [Household Food Insecurity](#)
 - [Pressure Injuries: Prevention and Management](#)
 - [Seniors Health Overview \(65 years and older\)](#)
- [Tools to Address Malnutrition](#)

ASPEN (American Society of Parenteral and Enteral Nutrition)

- [Resources for Clinicians Caring for Patients with Coronavirus](#)

What resources are available for adult patients?

Available on AHS website:

- [COVID-19: Nutrition for Recovery](#)
- [Nutrition and COVID-19](#)
- [Stay Strong with Nutrition: Seniors and COVID-19](#)
- [Nutrition Education Materials \(Handouts\)](#)
 - Includes resources on dysphagia, higher calorie and protein, and vitamins, minerals, and medications
- [Recipes to Help You Get Enough Calories and Protein](#)
- [Tools to Address Malnutrition](#)

BC Cancer Agency

- [Cancer Control Alberta \(CCA\): Managing Your Nausea and Vomiting](#)
- [BC Cancer Agency: Practical Tips to Help Manage Nausea](#)

Canadian Nutrition Society

- [What Can I Eat at Home After Being in the Intensive Care Unit with COVID-19](#)

Dietitians of Canada

- [UnlockFood.ca](#)

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Government of Canada

- [Government of Canada: Food safety](#)
 - [Coronavirus disease \(COVID-19\) and food safety](#)
 - [Safe cooking temperatures](#)

National Health Service (NHS) United Kingdom (UK)

- [NHS: Supporting your recovery from COVID-19](#)

World Health Organization

- [Support for Rehabilitation: Self-Management after COVID-19 Related Illness](#)

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