



Nutrition In Cirrhosis

A GUIDE FOR PATIENTS



The Nutrition In Cirrhosis Guide

The Guide was made possible from extensive feedback provided by patients, and their family and friends, who attend The Cirrhosis Care Clinic (TCCC) at the University of Alberta located in Edmonton, Alberta, Canada.

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This Guide covers general topics relevant to all patients with cirrhosis. Specific nutrition issues are also addressed that may be helpful at other times. The Guide is a tool for use throughout your cirrhosis journey.

The Guide is intended to be read a few pages at a time, beginning with those most important to your health or of interest to you.

The recipes are suitable for all individuals and can be modified to accommodate food allergies, dietary restrictions, and preferences.



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Clinician Primer



Many patients with cirrhosis are at risk for malnutrition (a term used synonymously with 'under nutrition' in the Guide).

Malnutrition increases the:

- risk of mortality
- prevalence of portal hypertension-related complications
- infections
- length of hospitalization ²⁻⁴

Our chapter specific for overweight patients notes that nutritional assessment and management of this population ideally requires regular involvement of a registered dietitian.

Why use The Nutrition in Cirrhosis Guide in your clinic?

Consensus-based nutrition guidelines have been developed to identify, treat, and prevent malnutrition in patients with cirrhosis ^{1,5-8}. The incorporation of these cirrhosis-specific guidelines into routine care for hospitalized and non-hospitalized patients has been challenging due to multifactorial barriers, including:

- ready access to dietitians
- nutrition education specific to cirrhosis
- patient nutrition knowledge
- lack of attention given to food avoidance and intolerance ^{6,9}

This evidence-based Guide distills practice guidelines into simple messages augmented with nutritious, easy-to-prepare, low-cost meal suggestions that fulfill the unique needs of patients with cirrhosis. The Guide was co-designed and field-tested by patients and caregivers ensuring that the content is relevant, meaningful, and accessible.



Who should read The Nutrition in Cirrhosis Guide?

Patients with cirrhosis at any stage will benefit from reading the Guide. The Guide is comprehensive and is not intended to be read in a single sitting. Certain segments or chapters will be more relevant at different disease stages.

What formats are available for The Nutrition in Cirrhosis Guide?

- Please visit www.liver.ca/nutritionincirrhosis or www.wellnesstoolbox.ca to request hard copies or to download and print a digital copy.
- Please provide feedback to your care provider, who can notify our team. Updates will be available on the websites listed.

What are other patient-friendly websites specific to cirrhosis?

- To access patient-oriented material about cirrhosis and its complications, we encourage you to direct your patients to: www.liver.ca/cirrhosis or <https://www.hepatitis.va.gov/patient/complications/cirrhosis/single-page.asp> or http://www.catie.ca/sites/default/files/Catie_Cirrhosis_web_EN_July22-2015.pdf

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My Nutrition Prescription

Please ask your dietitian or your health care practitioner to complete this summary page for you. An online calculator is available at www.wellnesstoolbox.ca to make these calculations easier.

Date:

My height is:

My weight is:

My BMI is:

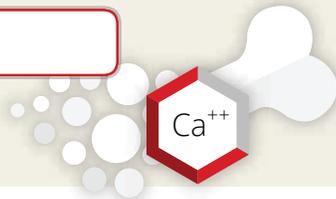
My daily calorie intake range should be: (refer to pages 13-14)



My daily protein intake range should be: (refer to pages 16-17)



My daily calcium intake range should be: (refer to page 21)



I have edema or ascites. My daily sodium limit is: (refer to pages 18-20)

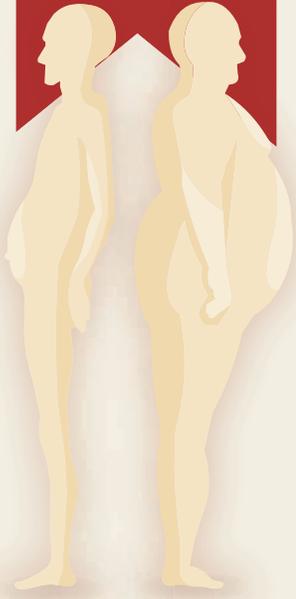


I need a late night snack. See page 15 for late night snack ideas.

1 Chapter

Malnutrition*

What is it and why is it so important?



Malnutrition means the body is not receiving enough nutrients to perform necessary bodily functions. Over time, the malnourished body begins losing important functions and symptoms appear:

- **Muscle weakness and fatigue, general tiredness**
- **Longer time needed to heal small wounds or bruises**
- **Skin, hair, and nails become brittle, dry, and may break easily**
- **More frequent infections**
- **Slowed or foggy thinking**

Malnutrition can occur rapidly (within a week) or gradually over many weeks. Each person is different!



Patients with cirrhosis can be:

- Well nourished
- Moderately malnourished
- Severely malnourished



Signs of malnutrition are:

- Unexpected weight loss
- Loss of muscle mass in the face, upper arms, chest, and thighs
- Muscle weakness (e.g., unable to climb stairs)
- Loss of appetite and eating less food

Healthcare practitioners will ask about changes in body weight and eating habits.

Losing weight when not trying to is a good indicator of malnutrition. Feeling full and skipping meals or avoiding certain foods are also indicators that a person may be malnourished.

A healthcare practitioner may examine muscles in the upper arm or thigh at each appointment. Measuring muscle mass or strength is another way of monitoring malnutrition.

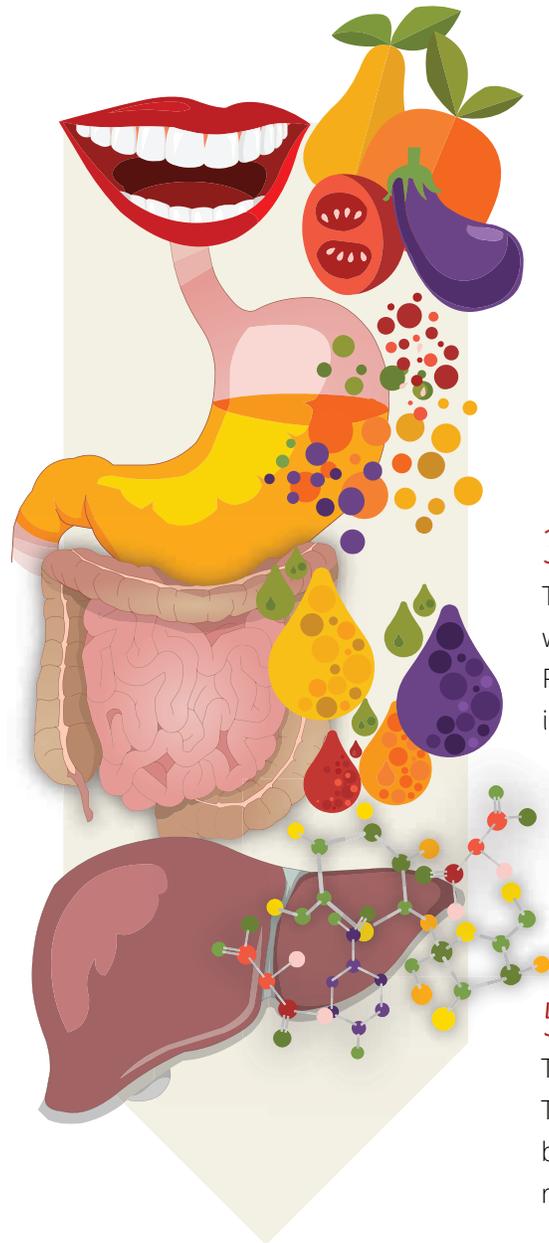
Why does malnutrition matter?

Patients with malnutrition have worse health outcomes, such as:

- More severe liver disease
- Higher risk of infections
- Higher chance to be hospitalized
- Higher risk of death

* Malnutrition in the Guide refers to “under nutrition” or lack of adequate nutrition.

What is the role of the liver in digestion?



1.

Food is broken into small pieces by biting and chewing. Swallowing helps the food travel to the stomach.

2.

In the stomach, acids and enzymes continue to break the food into smaller and smaller pieces.

3.

The food travels to the small intestine where the digestion process continues. Proteins, fats, and sugars are absorbed into the bloodstream.

4.

The liver filters the proteins, fats, and sugars from the blood and converts them into simple building blocks.

5.

The liver stores extra sugars as **glycogen**. The liver releases the glycogen into the blood stream between meals providing a regular supply of energy to the body.



In many cultures, the liver is believed to be the most important organ, not the heart!



The liver is the second largest organ in the body. The largest organ is the skin.



The liver performs over 500 functions in the body!

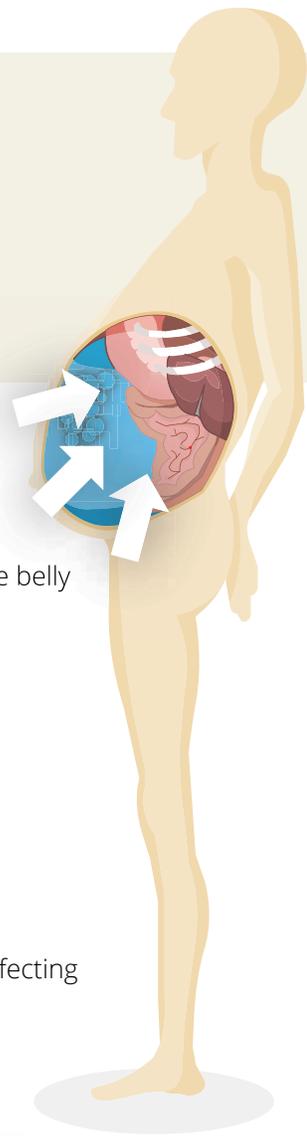




Ascites

Pronounced “**uh-SIGH-teez**”

Describes the situation when fluid accumulates in the belly. The belly can swell, be uncomfortable, and make it hard to breath.



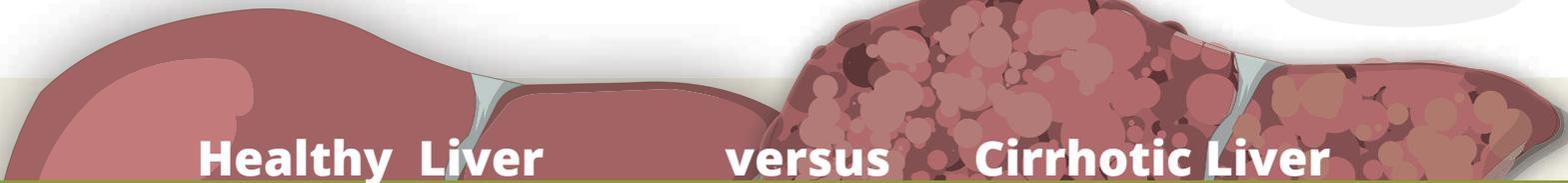
How can cirrhosis symptoms lead to malnutrition?

1. Cirrhosis can reduce the amount of food eaten.

- Feeling full after eating a small amount (“early satiety”), can be caused by fluid retention in the belly (“ascites”)
- Forgetting to eat meals or snacks due to mental confusion
- Side effects of some medications can cause nausea or vomiting
- Certain medications or nutrient deficiencies can change the smell or taste of food making it unpleasant to prepare or eat

2. Cirrhosis can cause functional changes in the damaged liver.

- In cirrhosis, the liver is no longer able to perform all of its many functions. Certain changes affecting digestion are presented below.



Healthy Liver

Most proteins, fats, and sugars are filtered from the blood stream

Most nutrients are converted into the necessary chemicals

Most excess sugars are formed into glycogen

Glycogen is released in response to the body's needs between meals

versus Cirrhotic Liver

Some proteins, fats, and sugars are filtered from the blood stream

Some nutrients are converted into necessary chemicals

Some excess sugars are formed into glycogen

Some glycogen is released between meals

The cirrhotic liver cannot store as much glycogen as a healthy liver. Without frequent replenishment from meals or snacks, the glycogen reserve is consumed quickly.

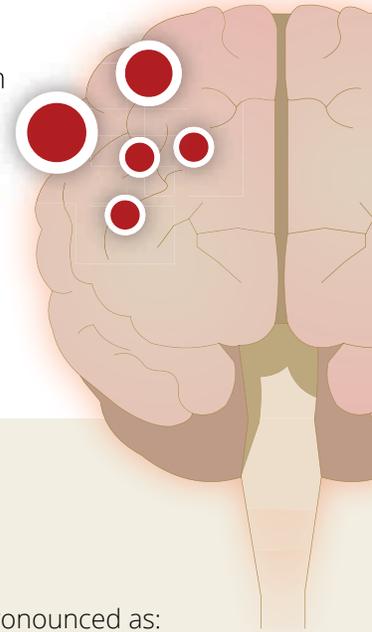
In desperation, the liver breaks down muscle tissues to fuel the cellular processes keeping the body alive.

After missing several meals or snacks, the body loses muscle mass, muscle strength, and body weight. All of these are characteristics of malnutrition.



3. Cirrhosis causes temporary episodes of confusion, known as hepatic encephalopathy.

- Ammonia is naturally produced by the body and is removed from the bloodstream by a healthy liver
- In cirrhosis, hepatic encephalopathy occurs when the liver cannot filter ammonia from the blood stream
- Symptoms of hepatic encephalopathy include changes in memory, sleep, and concentration. Some patients may have problems with writing, driving, maintaining their balance, or doing other daily activities.
- During hepatic encephalopathy, patients may forget to eat meals and snacks



Deficiencies in vitamin B12, folate, iron, and zinc can cause taste changes. A daily multivitamin may correct or prevent some deficiencies. Contact a healthcare practitioner, pharmacist, or dietitian for assistance.



Hepatic Encephalopathy

Hepatic encephalopathy is pronounced as: **“heh-PAT-ik en-SEF-uh-LAWP-uh-thee”**

hyper-metabolic



Pronounced:
“hy’per met’a’ball’ik”

4. Cirrhosis can cause higher than normal energy needs or “hypermetabolism”.

- 20% of patients with cirrhosis have **high** energy needs and must eat **more** food than others
- When diagnosed with hypermetabolism by a physician, one needs to eat **more** to prevent malnutrition

Nutrition is important in cirrhosis because it:

- helps the damaged liver perform its many functions
- lowers the risk of infections
- lowers the risk of bleeding complications
- lowers the risk of fluid retention (ascites)
- provides energy for daily activities and socializing!
- lengthens your life!



Tip: If your healthcare practitioner says that you are **hypermetabolic**, you now require more “fuel” (food) to power your “furnace” (body) than before. If you continue eating the same as before, you may have unwanted weight loss.

Caution:

Not every patient with cirrhosis is diagnosed as hypermetabolic. In fact, some patients may be asked to lose weight by their healthcare practitioner (see Chapter 6 for managing weight loss and fatty liver disease).



What should I eat and what to avoid?



This section includes common calculations for:

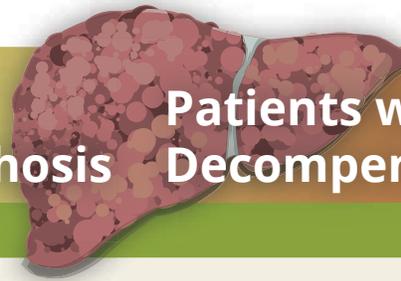
- ➔ Ideal body weight if you are overweight or obese
- ➔ Estimated dry weight if you are retaining fluids (ascites and/or edema)
- ➔ Daily calorie and protein intakes

In this chapter, we have included detailed explanations and graphs for each of the common calculations (for those of you who would like to understand where these originate from).

In order to make the calculations easier (and for those of you who don't like math), we have developed an online calculator at www.wellnesstoolbox.ca. We recommend that you access this tool to determine these values. Please check all calculations with your health care practitioner. Certain patients may have special requirements.

Patients with Compensated Cirrhosis

Patients with Decompensated Cirrhosis



Liver Health



Have few or no liver-related complications

Have liver-related complications like ascites and hepatic encephalopathy

Diet



Need to:

- Eat healthy, well-balanced meals
- Eat high-protein, low-sodium foods
- Avoid alcohol

Need to:

- Eat healthy, well-balanced meals
- Eat high-protein, low-sodium foods
- Avoid alcohol
- Patients with higher metabolic rates need to eat more food

When to eat?



Need to:

- Eat 3 balanced meals each day
- Eat snacks between meals if hungry

Need to:

- Eat every 2-4 hours when awake
- Have a late evening snack before bed
- Eat a snack in the middle of the night if awake!

Energy

In decompensated cirrhosis, the body may need more calories than it has in the past.

This means increasing the quantity of food eaten and how often one eats.

Two main nutrition goals in cirrhosis are:

- ➔ **Avoid weight loss** (unless directed by a physician)
- ➔ **Maintain muscle mass through exercise and eating well**

If overweight or obese, ask for a referral to a dietitian and an exercise therapist to assist in meeting weight loss goals.

See Chapter 6 in this Guide for recommendations specific to obesity and cirrhosis.



How much do I weigh?

Unexpected changes in body weight are an important sign of malnutrition.

If you are not retaining fluids, your body weight will be equal to the weight shown on the scale (also known as a bathroom scale or body weight scale).

If you are retaining fluid (leg swelling and/or ascites), your weight shown on the scale needs to be adjusted by subtracting the extra water weight. This is called your "Estimated Dry Weight".

Your "Estimated Dry Weight" can be estimated in two ways:

1. After a **paracentesis** using the weight shown on the scale
2. By using your body weight before retaining fluids and needing paracentesis

I don't have excess body fluid. My scale weight is:

I am retaining excess fluid. My "Estimated Dry Weight" is:

Paracentesis

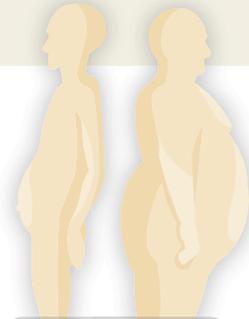


A bedside procedure to remove excess fluid (ascites) from the belly using a needle and drainage bag.

"par-a-cen-tee-sis"

What is BMI?

The "Body Mass Index" or BMI is a ratio between height and weight or height and estimated dry weight. BMI is used to determine an individual's daily caloric intake.



What is my BMI?

Option 1: Ask a healthcare practitioner for assistance

Option 2: Use an online calculator to make these calculations

easier -- this can be found at www.wellnesstoolbox.ca. Check this with your healthcare practitioner.

My BMI is:

How many calories should I eat each day to maintain my weight and prevent unwanted weight loss?

The number of calories needed for weight maintenance is based on your BMI.

See the next page to estimate the daily caloric intake for your healthy weight.

Patients who are obese and trying to lose weight need to consult their healthcare practitioner to determine the best way to achieve weight loss.

My daily calorie intake range is:

There are online tools and apps for calorie tracking!

My Fitness Pal www.myfitnesspal.com

Nutrient values of some common foods (for manual tracking)

http://www.hc-sc.gc.ca/fn-an/alt_formats/pdf/nutrition/fiche-nutri-data/nvscf-vnqau-eng.pdf



There are many free apps and tools to use.

I can share my progress with my healthcare practitioner!



Calories come in the form of:

- Proteins
- Fats
- Sugars (Carbohydrates)

Daily calorie intake

Patients with cirrhosis should weigh themselves each week and record their weight at least once a month. Doing so will identify trends in weight gain, loss, or maintenance and help determine how many calories to eat each day.

This activity provides an **ESTIMATE** of your daily calorie needs. This is useful to do every 3 months between appointments with your practitioner.

Determining your daily calorie intake

If your BMI is 25 or less, continue on this page.

If your BMI is greater than 25, move on to the next page.

Step 1: Using Graph #1 below, find your Body Weight in kilograms along the bottom and place your finger on the amount.

Step 2: Now, move your finger directly up in a straight line. The area between the red and yellow lines is the target calorie range to eat every day.

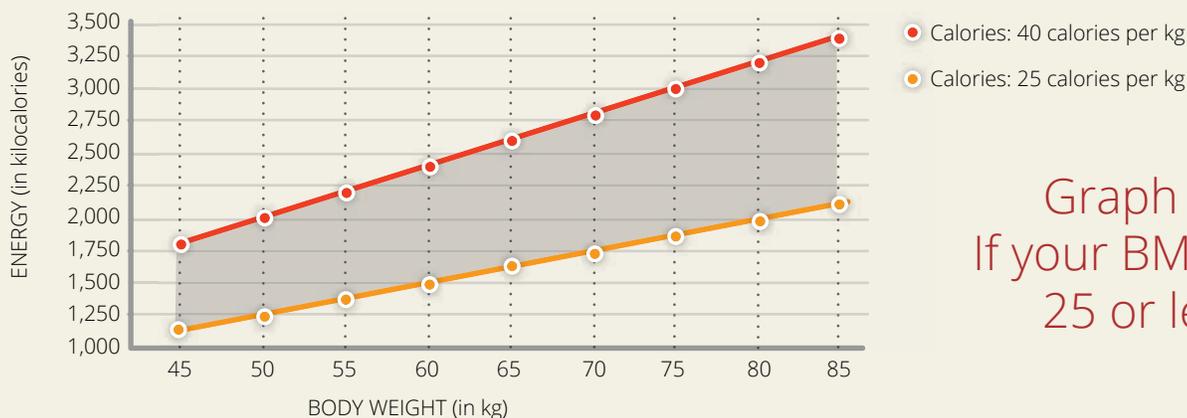


Ask your healthcare practitioner for assistance with this activity.

Your practitioner may need to adjust your daily calorie intake depending upon your specific health status.

Activity

My daily calorie intake range is :



Graph #1
If your BMI is
25 or less



Tips to manage your weight

- If you have lost weight recently, are malnourished, or your BMI is less than 20, you likely need to eat **MORE** calories.
Set your goal closer to the upper red line (40 calories per kg).
- If your weight has been stable for several months and your BMI is close to 25, set your daily goal closer to the bottom yellow line (25 calories per kg).
This may help prevent unwanted weight gain.



If your BMI is greater than 25, continue on this page.

Tip:

The first time you do this, ask your health-care practitioner for assistance.



Your practitioner may need to adjust your daily calorie intake depending upon your specific health status.



Step 1: Determine your "Ideal Body Weight" by completing the following:

$$25 \times \boxed{} \times \boxed{} = \boxed{} \text{ kg}$$

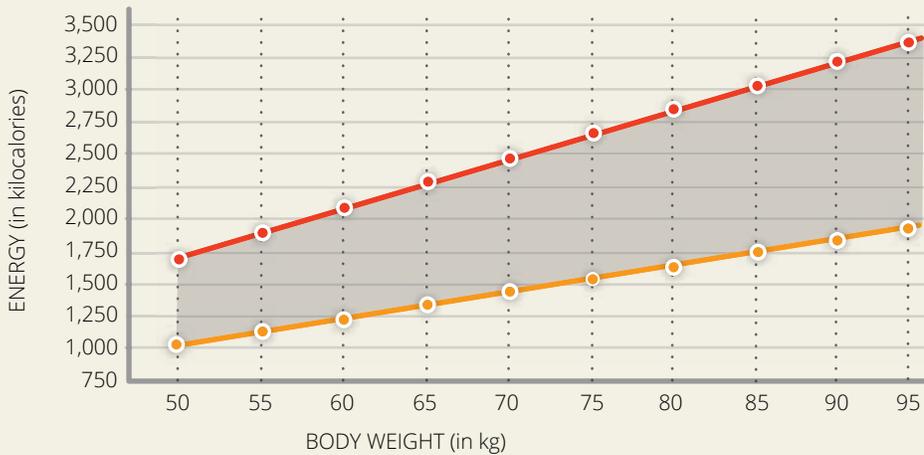
My height in metres My height in metres My "Ideal Body Weight"

Step 2: Using Graph #2 below, find your "Ideal Body Weight" along the bottom and place your finger on the number.

Step 3: Now, move your finger directly up in a straight line. The area between the red and yellow lines is the target calorie range to eat every day.

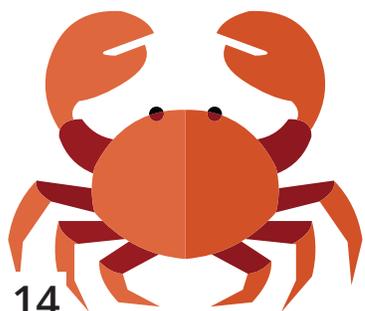
Activity

My daily calorie intake range is :



- Calories: 35 calories per kg
- Calories: 20 calories per kg

Graph #2
If your BMI is greater than 25



The skinny on "fat cells" (if your BMI is greater than 25)

Cells that store body fat are called "fat cells".
 Fat cells do not need energy to survive.
 The weight from fat cells should not be used to calculate calorie needs.
 Instead, use the Ideal Body Weight to estimate the daily calorie needs.
 This will prevent unwanted weight gain.

Meal and snack timing

Small, frequent, and protein rich meals evenly distributed throughout the day will help preserve muscle mass. This means having 6 small meals every day, or eating every 2-4 hours while awake.

A late evening snack is recommended about 1-2 hours before bedtime and should contain at least 50 g of complex sugars, such as:

- 1 bottle (235 ml) of high calorie nutritional meal supplement
- Peanut butter on 2 slices of toast and 1 cup of milk mixed with 1 tbsp whey protein powder
- 3/4 cup greek style yogurt, 1 cup strawberries, 2 tbsp hemp seeds, 1 tsp honey drizzled on top
- Chocolate peanut butter smoothie with 1 banana, 1 cup skim milk, 1 tbsp cocoa, 1 tbsp peanut butter and 1 tbsp whey protein OR 1/2 cup vanilla greek yogurt



Label Reading Rules

When grocery shopping, pay attention to the Nutrition Facts Table to make the best choices for eating well.

1 Serving size. Start at the top of the label. Compare this to the amount you eat. This amount will tell you the size of a single serving and the total number of servings per package.

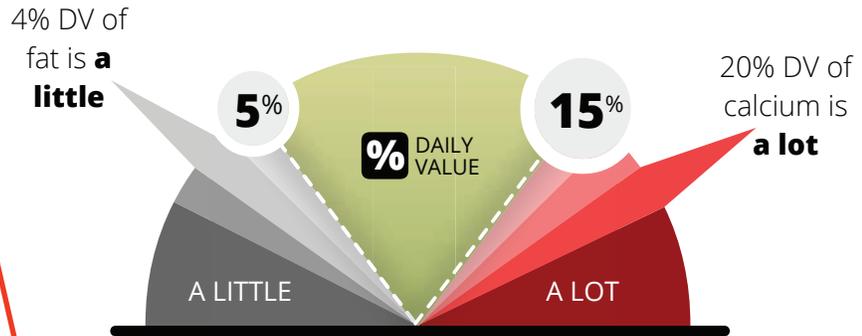
2 Amount of Calories. Next, check total calories per serving. The calories listed are for one serving of the food.

3 Protein. Protein is a building block of muscle, and is important for many bodily functions. People with liver disease need more protein than everyone else. Look for food products with more protein.

4 Saturated Fat. Eating too much saturated fat increases the risk of high cholesterol and heart disease. Try to eat less than 10 g per day as recommended by nutrition guidelines.

5 Sodium. Prepackaged foods often contain a high amount of sodium because it is used to flavour and preserve foods. Sodium can make symptoms of liver disease worse and should be limited as much as possible. Choose products with less than 10% DV sodium in each serving. As a rule, the closer to 0% DV, the better!

6 Calcium. Calcium is shown at the bottom of food labels as a % DV. This percentage is based on 1,100 mg calcium per day. In liver disease you need more calcium compared to the general population. Choose products that are high in calcium.



Nutrition Facts	
Serving Size ¼ cup (55g)	
Servings Per Container 5	
Amount Per Serving	
Calories 250	Calories from Fat 50
% Daily Value*	
Total Fat 6g	9%
Saturated Fat 0.5g	3%
Cholesterol <5mg	<2%
Sodium 200mg	8%
Total Carbohydrate 40g	13%
Dietary Fibre 4g	16%
Sugars 18g	
Protein 9g	18%

Vitamin A 25% • Vitamin C 50% • Calcium 30% • Iron 25%
*Percent Daily Values based on a 2,000 Calorie diet.

% Daily Value (DV): This tells you how the nutrients in one serving contribute to your total daily diet. The % DV indicates if an item has “a little” or “a lot” of a nutrient.

You should have LESS:

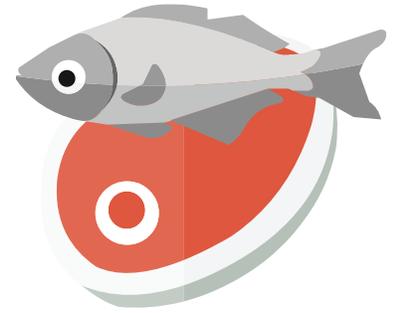
Saturated Fat
Sodium

You should have MORE:

Calcium
Protein
Fibre

Protein

The body needs protein for many functions of the body, such as building and maintaining muscle, healing tissues, and supporting the immune system. Patients with cirrhosis need more protein than what is recommended in Canada's Food Guide.



Understanding how much protein you need

The goal in cirrhosis is to eat 1.2-1.5 g/kg of protein each day.

Proceed to the [Protein Graph](#) below if your BMI is 30 or less.

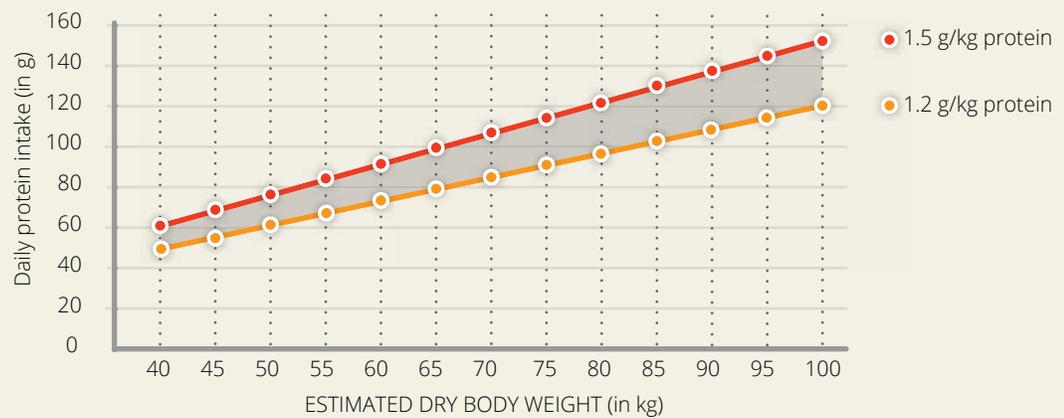
If your BMI is more than 30, complete the "Activity" at the bottom of the page then use the Protein Graph.

Protein Graph

Find your dry weight along the bottom axis marked ESTIMATED DRY BODY WEIGHT (see Chapter 2).

Then move up to find the range of protein (gray zone between the red and yellow lines) to eat.

The range indicates the amount of protein in grams to eat every day.



How to meet your protein goal:

Include a variety of protein-rich foods at every meal and snack (see examples on next page).

Eating multiple sources of protein-rich foods will reduce the chance of repetition and food boredom.

Concern:

In cirrhosis, some protein-rich foods, such as red meats, may no longer be appealing.

Solution:

Try eating other protein-rich foods, like meal supplements, protein powders, dairy products, and vegetable proteins (beans, peas, lentils).

What about calcium?

In cirrhosis, it is necessary to increase the intake of calcium to prevent brittle bones that can easily fracture or break.



Activity:

An online calculator to determine this is available at: www.wellnesstoolbox.ca

You can do this with your healthcare practitioner!

If your BMI is more than 30, use what is called your "Ideal Body Weight." This weight is based on a BMI of 25. To figure out your "ideal body weight" follow these steps:

$25 \times \text{height (metres)} \times \text{height (metres)}$

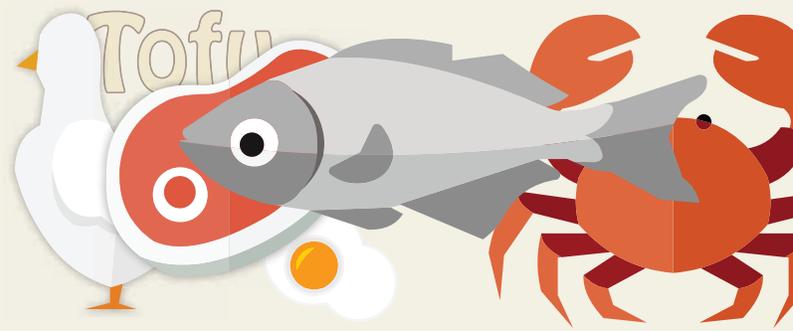
My Ideal Body Weight is:

$25 \times \text{_____ metres} \times \text{_____ metres} =$

 kg

Protein

2.5 oz of meat is:
the size of a deck of cards



Food Item	Measure	Equivalents	Weight (g)	Protein (g)	Sodium (mg)
Meat and Meat Alternatives					
Beef, Pork, cooked	2.5 oz	deck of cards	75	25	45
Chicken, Turkey, cooked	2.5 oz	"	75	20	50
Fish, baked/fried/steamed	2.5 oz	"	75	18	40
Canned fish in water, low sodium	75 g (1/3 cup)		75	18	50-70
Egg	1 large		50	6	65
Shrimp, boiled/steamed	6 small		30	6	67
Chick Peas, Beans, Lentils, canned (rinse first) /boiled	3/4 cup	tennis ball	175 ml	11	30
Peanut Butter (commercial)	2 tbsp		30 ml	8	149
Peanut Butter (natural)	2 tbsp	golf ball	30 ml	7	2
Peanuts, Almonds (unsalted)	1/2 cup	2 golf balls	37	8	2
Tofu (regular, firm, extra firm)	150 g	hockey puck	150	21	26
Dairy Products and Supplements					
Milk, skim, 1%, 2%, whole	1 cup		258	9	105
Milk, 1% chocolate	1 cup		258	9	152
Soy beverage, unsweetened	1 cup		257	7	95
Skim milk powder	~ 1/3 cup		25	9	120
Yogurt, Greek, plain, flavoured	3/4 cup	tennis ball	180	16	65
Yogurt, plain, flavoured	3/4 cup	tennis ball	180	9	115
Cheddar Cheese (from block)	1.5 oz	9-volt battery	50	12	300
Mozzarella Cheese (from block)	1.5 oz	"	50	10	186
Swiss Cheese	1.5 oz	"	50	13	96
Meal Supplement Drinks, high protein plus calories	1 bottle		235 ml	12-15	200-290
Whey Protein Powder	2 tbsp	golf ball	28	20	120
Grains and Starches					
Bread, whole wheat	1 slice		35	5	165
Bread, pita, whole wheat (16.5cm) diameter	1 each		64	7	372
Bagel, plain	1 bagel		71	7	318
Pasta, enriched spaghetti, cooked	1 cup	fist	140	8	1
Special K® Protein cereal, Kellogg's®	1 cup	fist	50	10	125
Vector® Cereal, Kellogg's®	1 1/4 cup	fist & 2 golf balls	55	5.5	220
Edge® Cereal, General Mills®	1 cup	fist	58	11	290
Granola Bar, Natural Valley® Protein	1 bar		40	10	180
Vector® Protein Bar, Kellogg's®	1 bar		40	11	190
Clif Builder's® Bar	1 bar		68	20	200

Sodium

The body needs some sodium to function.

In cirrhosis, too much sodium can worsen ascites (belly swelling), edema (swelling in feet and legs), and esophageal varices (swollen veins in the food pipe). A diet high in sodium can also cause kidney problems.

To maintain health, it is important for a patient with cirrhosis to restrict salt intake.

Fact:

The average Canadian consumes greater than 3,400 mg of sodium per day, more than 3/4 comes from prepackaged, processed, and restaurant foods.

Fact:

1 teaspoon (6 g) of salt (table salt, sea salt, iodized salt) contains 2,300 mg of sodium

Fact:

Patients with advanced liver disease should consume **LESS THAN 2,000 mg of sodium per day**



Tip:

The words salt and sodium are not exactly the same thing, BUT:

- ➔ Salt in most foods is found in the form “sodium chloride” or “sodium iodide”.
- ➔ Salt is salt, whether it’s Himalayan, Kosher, Rock, Sea, or Table Salt. All of these contain the same amount of sodium.

This Guide uses the word “sodium” to advise a sodium restricted diet. Your doctor may also call this a “low-salt diet”.

What does this mean?

Following a low-sodium diet is not as simple as getting rid of the salt shaker. In addition to **not adding salt** to food, it is important to cook and eat foods with low sodium contents.

Low sodium cooking: tips and tricks!

Herbs, spices, and marinades add to or enhance the flavour of food without increasing sodium.

In 2-3 weeks, tastes adjust to the new flavour combinations and salt cravings become a thing of the past!

- Cooking tips:
- Boil potatoes, rices, pasta, and hot cereals with herbs instead of adding salt to add flavour
 - Use 3x more fresh herbs than dry herbs to get the same flavour intensity
 - For hot foods, add crushed herbs or spices near the end of cooking to get the most flavour
 - For cold dishes (e.g., dressings, salads), add the flavourants at the beginning of the preparation

If you like ...	Try one or more of these....	Add to.....
HOT	Cayenne pepper, chili (fresh, oils, powder), hot dry mustard, horse radish, white or black pepper, red pepper flakes, wasabi	Beans, lentils, tofu, beef, chicken, turkey, anything!
CITRUS/SOUR	Lemon, lime, tamarind, vinegars	Asparagus, green beans, tofu, chicken
SWEET	Allspice, anise, caraway, cardamom, cinnamon, cloves, fennel, honey, molasses, nutmeg, poppy seeds, sesame seeds, star anise	Apples, beans, potatoes, salads, squash, yams, rice, chicken
HERBACEOUS	Basil, dill, mint, oregano, parsley, rosemary, sage, tarragon, thyme	Asparagus, peas, potatoes, tomatoes, rice, pasta, beef, chicken, fish, eggs
SULFURY	Chives, garlic, onion (green, red, white)	Potatoes, tomatoes, rice, pasta, beef, chicken, fish, eggs

Overview of some low versus high sodium foods

Choose

Limit or avoid

Vegetables and Fruit



- Fresh vegetables
- Vegetables canned with no added salt
- Tomatoes canned with no added salt
- 100% fruit juices

If you are on a low-potassium diet, ask your dietitian which of these foods are recommended.

- French fries, hash browns, and potato chips, salted
- Sauerkraut
- Potatoes from a mix
- Tomato juice, vegetable juice, and vegetable cocktail
- Tomato sauce, pasta sauce, and salsa
- Vegetables canned with salt
- Vegetables frozen, with cream, or tomato sauce

Grain Products



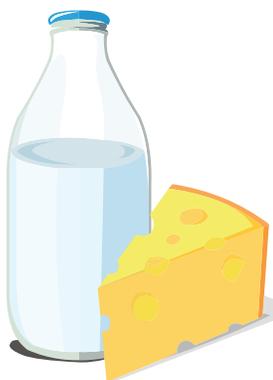
Choose foods with the lowest sodium amounts for the following:

- Baked goods (homemade) like muffins, pancakes, or waffles made without added salt
- Breads, buns, bagels, pitas, English muffins
- Barley, bulgur, millet, oats, quinoa, rye
- Rice cakes, crackers, and cookies (unsalted)
- Cold cereals and hot cereals (not instant)
- Pasta, couscous
- Rice, brown rice

If you follow a low-phosphorus diet, ask your dietitian which of these foods are right for you.

- Baked goods from dry mixes
- Baked goods (from a restaurant or store-bought)
- Rice cakes and crackers (salted, or seasoned)
- Hot cereals (instant) with higher than 15% Daily Value for sodium
- Pasta, rice, or noodles that are canned, instant, or from a mix
- Stuffing mixes

Milk and Alternatives



Choose brands with the lowest sodium amounts for the following:

- Milk (skim, 1%, 2%) or soy beverages
- Cheeses: small amounts of hard cheeses such as cheddar, mozzarella, marble, Swiss
- Cheeses (soft) such as cream cheese, brie, and ricotta
- Cottage cheese, no salt added
- Yogurt or kefir

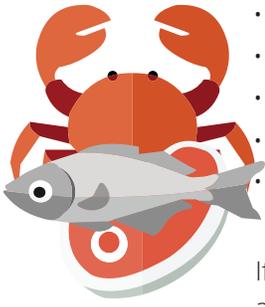
If you need to follow a low-phosphorus diet, ask your dietitian how much of these foods are right for you.

- Cheese slices or cheese spreads, (processed)
- Cheeses having high sodium contents: blue, feta, and Parmesan
- Cottage cheese, regular
- Pudding or custard, instant mixes
- Buttermilk

Choose

Limit or avoid

Meat and Alternatives



- Beans, peas, and lentils (dried), cooked without salt. Rinse canned products.
- Eggs
- Meat, poultry, fish (fresh)
- Nuts and nut butter (unsalted)
- Tofu
- Tuna or salmon (canned), no salt added

If you follow a low-phosphorus diet, ask your dietitian how much of these foods are right for you.

- Meat, poultry, fish (canned) with salt
- Meat, poultry, fish (breaded or seasoned)
- Nuts (salted)
- Processed meats, such as:
 - bacon
 - bologna
 - corned beef
 - deli meat (chicken, turkey, and roast beef)
 - ham
 - hot dogs/wieners
 - pepperoni
 - sardines
 - salami
 - sausages
 - smokies

Spices, seasonings, and condiments



- Gravies, sauces and dips (homemade) without salt
- Herbs and spices with no salt added such as:
 - basil
 - black pepper
 - cardamom
 - cayenne pepper
 - chili oil
 - cinnamon
 - cumin
 - dry mustard
 - garlic (fresh or powder)
 - ginger
 - mint
 - onion (fresh or powder)
 - parsley
 - paprika
 - rosemary
 - tarragon
 - thyme
 - turmeric
- Lemon or lime juice, vinegar
- "No added salt" seasonings
- Sauces with less than 5% Daily Value for sodium

- Sea salt, table salt
- Spices or seasoning mixes that have salt or sodium, such as seasoning salt, garlic salt, onion salt, celery salt, lemon pepper, channa masala, chaat masala, meat masala, tandoori masala.
- Pre-made, packaged gravies, sauces, and dips
- Bacon fat
- Canned or packaged broth, bouillon cubes, or consommé
- Condiments such as mustard, ketchup, relish, tartar sauce, salad dressings, and mayonnaise (limit to 1 Tbsp (15 mL) per day)
- Salsa, pickles, olives
- Sauces such as steak sauce, BBQ sauce, marinating sauces, soy, teriyaki, hoisin, black bean, or fish sauce
- Breading and coating mixes

Other foods



- Non-hydrogenated margarine (unsalted) and vegetable oils. Use small amounts.
- Soups, homemade (limit the amount of sodium/salt added)
- Check the sodium content on labels of unsalted snacks such as pretzels, tortilla chips, rice cakes, some microwave popcorn, and air popped popcorn. They may contain salt!

- Fast foods and restaurant foods
- Snack foods such as salted chips, nachos, pretzels, popcorn, bhujia, and crackers
- Soups (canned or dried) such as, oriental noodle mixes or soup cups
- Casserole mixes
- Frozen, deli, or take-out foods



Calcium

Osteoporosis (bone loss causing weak bones) occurs more often in cirrhosis partially from not eating enough calcium.

Because bone loss is common, it is necessary to increase the intake of foods or supplements that provide calcium.

Calcium is a mineral that helps build and maintain strong bones and teeth as well as helping the muscles and heart work properly.

A list of common foods that contain 1 serving of calcium

Each of the foods listed below have 300 mg of calcium in the portions recommended = 1 serving

A daily calcium goal – Have **4 servings of calcium-rich foods every day.**



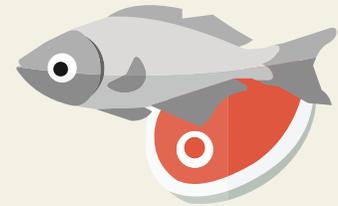
Milk and Alternatives

- Cow's milk – all varieties (1 cup)
- Soy, rice, or almond beverage, **fortified** with calcium (1 cup)
- Cheese: Swiss, cheddar, mozzarella, marble (1.5 oz)
- Yogurt: plain, flavored, Greek, regular (175 ml or ¾ cup)
- Ricotta cheese, partly skimmed (½ cup)
- Kefir (1 cup)
- Nutrition Supplement Drinks (1 cup)



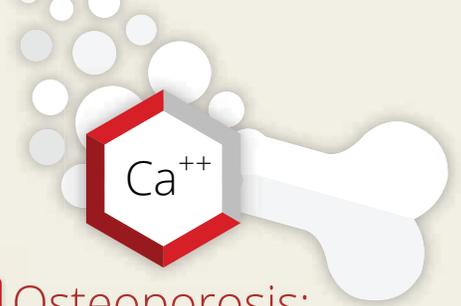
Fruits and Vegetables

- Spinach, boiled, steamed or sautéed (1 cup)
- Turnip greens, cooked (steamed or sautéed) (1 cup)
- Rhubarb, cooked (1 cup)
- Orange juice, fortified with calcium (250 ml)



Meat and Alternatives

- Sardines – canned in water with no salt added, with bones (100 -120 g/ 3-4 oz)
- Salmon, canned, unsalted with bones (120 g/ 4 oz)
- Tofu, prepared with calcium sulfate (175 g which is ~¾ cup)
- Beans (white, navy) canned or cooked (1½ cups)



Osteoporosis:

The loss of bone mass to the point where bones become brittle and fragile; they can fracture and break easily.

How much calcium do you need when you have cirrhosis?

1,200-1,500 mg/day from a combination of food sources and supplements is recommended

Activity:

Using the table above, how many servings of high calcium foods are you currently having every day?

Dairy = _____

Fruits/Vegetables = _____

Meat/Alternatives = _____

Total =

Vitamins

Patients with cirrhosis can be low in the following vitamins and minerals:

Vitamins - A, D, E, K, folic acid, B1, B2, B6, B12

Minerals - zinc, iron, selenium, and calcium

To get enough of these vitamins and minerals, take a **no iron** containing multivitamin or multi-mineral on a daily basis.

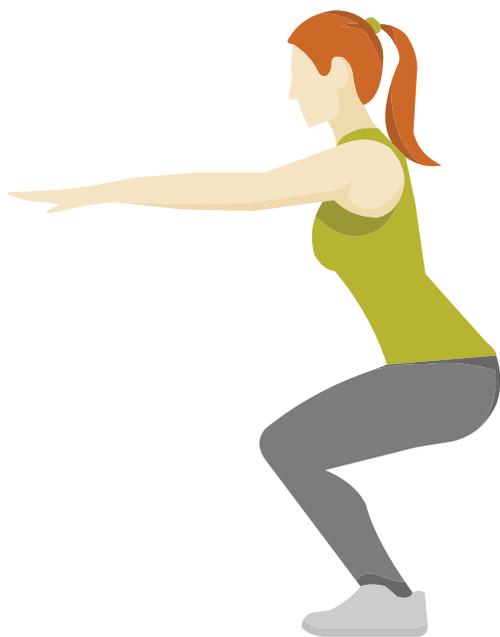


Too much copper, manganese, or iron can be harmful in cirrhosis.

Some patients will need to take iron depending on their specific situation.

A doctor or dietitian can help make sure you pick the safest option.

Exercise



Muscle mass loss is very common in patients with cirrhosis. This makes daily activities more difficult and causes tiredness.

A program of exercise in combination with the right nutrition may help to maintain and even increase muscle mass.

It is helpful to get a pedometer to track your activity level.

If you have cirrhosis, you should try to reach 5,000 steps or more each day.

Your health care practitioner will look for veins in your food pipe (called varices). Once they have ruled these out (or adequately treated them), ask your health care practitioner if you can include 3 days per week of moderate physical activity, such as walking or cycling for up to 30 minutes and 2 days per week of light weights. You can find exercises at www.wellnesstoolbox.ca.

Talk to your doctor about the exercise program that may be best for you. An exercise specialist or physiotherapist can help design an appropriate exercise program.

My favourite snack is:

Is it low in sodium and high in protein?

Yes

No

How can it be adjusted to help my liver?

My favourite meal is:

Is it low in sodium and high in protein?

Yes

No

How can it be adjusted to help my liver?

Notes and Goals:

Use this space to set nutrition goals that you would like to work on. For example, "My goal over the next month is to meet my protein target by eating 1.2-1.5 grams/kilogram per day. For me, this means eating 80 grams of protein per day". Seek assistance from your doctor or dietitian to help set these goals!

A large area of horizontal lines for writing notes and goals.



Tips for when you do not feel like eating



Side effects of cirrhosis may decrease appetite or make food unpalatable. Below are common reasons why patients find it difficult to eat enough and solutions to overcome these temporary issues.

1 "When I eat, I get full very quickly."

The sensation of early fullness is also called "early satiety". This decreases the amount of food you can eat, and can lead to weight loss and malnutrition.

Suggestions:

- ◆ Eat smaller, more frequent meals and snacks every 2-4 hours.
- ◆ Limit fluid intake when eating to reserve room for food.
- ◆ Avoid drinks like coffee, tea, and water since they can reduce your appetite overall and provide you with little nutrition.

Make your calories count!

Drink high calorie and protein meal replacement drinks or cream soups. These are easier to digest than solid foods and are nutritious.

- High protein smoothie – see Recipes chapter
- Meal replacement drink – see Meal Supplements chapter
- Homemade cream soup
- Pudding, yogurt, and custard

If you are up during the night, grab a quick snack or meal. Eat whenever it is possible!

Make sure not to skip meals or snacks.

Alert a healthcare practitioner about fluid retention.



Tip:

Keep a granola bar and meal supplement in the nightstand or bathroom for easy access during the night.



2

"I'm too tired to cook and eat."

Feeling extra tired is common in cirrhosis. This can interrupt grocery shopping, cooking, and even eating. Naps during the day may also cause meals or snacks to be missed unintentionally. Eating is so important because it provides the essential nutrients that can help with tiredness.

Suggestions:

When you have more energy, prepare meals in advance to store in the fridge or freezer, like:

- Hearty soups, stews, or chili
- Packaging leftovers into homemade, inexpensive "TV dinners"

Consider meal delivery programs, such as 'Meals on Wheels'.

- If "heart-healthy" options are available, choose these as they are usually lower in salt than other options – remember to check the label!
- Look into meal-prep businesses – the meal is assembled at their kitchen but is cooked at home. The benefit is that the groceries are purchased and already washed or even chopped or measured.

Use grocery shopping services offered by supermarkets or community programs; some stores have online ordering options.

Rely on simple-to-prepare meals and snacks presented in Chapter 5. Use meal supplements during the day and night as needed!

Ask friends and family for support by :

- Cooking and eating together
- Sharing meals
- Have a support person or friend prepare meals or snacks when possible

Avoid prepared foods and take out foods! These will only make the symptoms worse and may hurt the liver! Patients with cirrhosis may experience day/night reversal - this means a person is awake during the night and naps during the day. If this occurs, have 1 or 2 snacks between naps during the daytime and eat meals during the night.



3

"On days I have procedures or am admitted to the hospital, it is impossible to stick to a regular eating schedule."

Appointments, tests, procedures, and hospital admissions can take a while. In some cases, "fasting" is also required which makes it more challenging to fit in all of the meals and snacks. Nevertheless, it is important to stick as closely as possible to a regular eating schedule to help the liver.

Suggestions:

Eat a large meal just before midnight if required to fast overnight. Take a lunch bag packed with items that will not spoil to every appointment, procedure, or hospital admission:

- Include meal supplements, such as Boost® or Ensure®
- Snack bag of unsalted nuts or trail mix
- High-protein granola or cereal bars

4

“I don’t have enough money to buy food.”

A healthy liver diet does not have to be expensive. The higher costs of fresh meat and dairy products means that it is important to watch for sales, look for alternative protein sources, and be creative to make the most of the grocery budget.

Suggestions:

- Only shop the outermost aisles in a grocery store. These include the bakery, produce, dairy, and meat sections. This avoids the junk food aisles and prepackaged foods.
Purchasing healthier, lower-sodium foods will also reduce grocery costs
- Watch for sales
- Portion out bulk foods into serving sizes that can be stored and used as needed
 - ◆ Buying meats in bulk can save a lot of money!
- Join grocery store clubs or programs - most offer discounts and specials to members
- Instead of expensive meats, try substituting vegetable-based proteins, such as beans, lentils, and chickpeas.
 - ◆ These are low-cost protein sources that provide excellent nutrition
- If you are receiving social support, you may qualify for additional funding to cover the costs of a low-sodium diet.
 - ◆ Talk to a healthcare provider to see if you qualify.



Low-sodium Beef Taco Meat

Homemade taco seasoning:

- 1 tbsp chili powder
- 2 tsp onion powder
- 1 tsp ground cumin
- 1 tsp garlic powder
- 1 tsp paprika
- 1 tsp ground oregano

Combine ingredients in a bowl and mix together. Set aside.

1 lb extra lean ground beef

Add extra lean ground beef to frying pan. Cook beef on medium-high heat until it is no longer pink. Break up the ground beef with a spatula as it cooks. Add homemade taco seasoning (to taste) and 1-2 tbsp of water. Cook for another 3-5 minutes on low-medium heat.

Total servings: 4

Nutritional facts per serving (2 tacos):

- Calories: 200 kcal
- Protein: 27 g
- Sodium: 78 mg

Baked Chicken Thighs

- 1 lb boneless, skinless chicken thighs (about 6 medium thighs, thawed)
- 1 tbsp sodium-free seasoning (e.g., Mrs. Dash®)

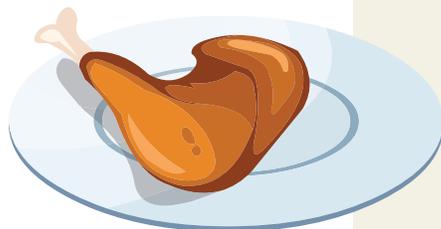
Preheat oven to 425 F.

Place chicken thighs onto a baking sheet lined with parchment paper. Season each side of chicken thighs with sodium-free seasoning or a homemade herb blend. Bake for 20-25 minutes.

Total servings: 3

Nutritional facts per serving (2 thighs):

- Calories: 260 kcal
- Protein: 40 g
- Sodium: 120 mg



Roasted Cauliflower

- ½ head of cauliflower, chopped into pieces
- 3 tbsp olive oil
- 2 tbsp lemon juice
- 1 clove garlic, minced
- 3 tbsp shredded parmesan cheese

Preheat oven to 400 F.

Add all ingredients to a large bowl and toss until all cauliflower pieces are coated. Line baking sheet with parchment paper. Spread cauliflower pieces across the parchment paper. Bake for 20 minutes or until cauliflower is soft.

Total servings: 3

Nutritional facts per serving:

- Calories: 133 kcal
- Protein: 4 g
- Sodium: 138 mg

Gourmet Hamburgers

- ½ cup minced onions
- ¼ tsp garlic powder
- ¼ tsp dried basil
- 1 tbsp olive or canola oil
- 1 tbsp lemon juice
- 2 tsp dried parsley
- 1 tsp water
- 1 lb lean ground beef

Mix all ingredients together in large bowl. Form into four 4" round patties that are ½ inch thick. Fry on medium heat or cook on BBQ until burger is no longer pink throughout.

Total servings: 4

Nutritional facts per serving ~1 patty:

- Calories: 380 kcal
- Protein: 38 g
- Sodium: 124 mg

Tuna Salad

- 1 can (120 g) tuna (canned in water, no salt added)
- 2 tbsp mayonnaise
- 1 splash lemon juice
- ¼ cup cucumber, chopped
- dash of black pepper to taste

Mix ingredients together in a medium bowl. Spread on bread or crackers.

Total servings: 1

Nutritional facts per serving (1 cup):

- Calories: 355 kcal
- Protein: 30 g
- Sodium: 267 mg



Tangy Coleslaw

6 cups pre-chopped coleslaw mix (or chopped cabbage and 1 shredded carrot)
½ medium chopped green pepper

Mix all of the above together in a large bowl.

Dressing:

3 tbsp sugar
¼ cup white vinegar
2 tbsp light corn syrup
2 tbsp oil
¼ tsp celery seed
dash garlic powder
dash onion powder

Add the dressing to the large bowl with the coleslaw and mix well.

Total servings: 6

Nutritional facts per serving (1 cup):

Calories: 105 kcal

Protein: 2 g

Sodium: 19 mg

Salmon Salad

1 can (214 g) salmon (canned in water, no-salt-added)
2 tbsp mayonnaise
¼ tsp black pepper (or to taste)
½ -1 tsp Mrs. Dash® lemon and pepper salt-free spice mix

Mix ingredients together in a medium bowl.

Total servings: 1

Nutritional fact per serving (1 cup):

Calories: 265 kcal

Protein: 21 g

Sodium: 256 mg

Banana Muffins

3 bananas, mashed
3 tbsp melted margarine
¾ cup sugar
2 eggs
¼ cup wheat germ
1 ¼ cup white flour
1 tsp baking soda
½ tsp baking powder
½ cup pecan or walnut pieces (optional)

Preheat oven to 350 F.

Mash ripe bananas in a large bowl using fingers or a spatula. Add margarine, sugar, and eggs and mix with a spatula until smooth. Add remaining ingredients and mix well. Spray muffin tin with cooking spray and add batter. Bake for 35-45 minutes.

Total servings: 13

Nutritional facts per serving (1 muffin):

Calories: 185 kcal

Protein: 3 g

Sodium: 154 mg



Hamburger Soup

1 ½ lb ground beef
1 onion, minced
4 carrots, minced
3 celery ribs, thinly sliced
½ cup barley
28 oz canned diced tomatoes
2 cup water
3 ½ cups no-sodium-added beef broth
1 can sodium reduced condensed tomato soup
1 bay leaf
1 tbsp parsley
1 clove minced garlic
½ tsp dried thyme
½ tsp ground black pepper

Crumble ground beef into a large soup pot. Place on medium-high heat and cook beef until it is no longer pink. Drain excess fat. Add remaining ingredients and bring to a boil, stirring frequently. Once boiling, turn the heat to medium-low and simmer for 2 hours.

Total servings: 6

Nutritional facts per serving (~1.5 cups):

Calories: 320 kcal

Protein: 28 g

Sodium: 376 mg

Flat Bread Chicken & Mushroom Pizza

1 large/2 small pita breads (choose lowest sodium by reading food labels)
1 boneless and skinless chicken breast
4 white button mushrooms
½ cup low-sodium tomato sauce
1 cup shredded mozzarella cheese

Preheat oven to 350 F.

Season chicken breast with low sodium seasoning (e.g., 'Garlic and Herb' or 'Italian Herb Blend' by Mrs. Dash®). Place chicken on a baking sheet covered in parchment paper. Bake chicken for 30 minutes, then let cool. Slice cooked chicken into thin slivers.

Increase oven to 425 F.

Spread tomato sauce over pitas, layer chicken and mushrooms to cover whole pizza. Top with shredded cheese. Place pizzas on a baking sheet lined with parchment paper. Bake for 5-7 minutes or until cheese is melted and browning. Sprinkle with pepper, chili flakes, fresh basil leaves, or parmesan cheese as desired.

Total servings: 2

Nutritional facts per serving (1 small pita or ½ large pita):

Calories: 270 kcal

Protein: 25 g

Sodium: 320 mg

Egg Salad

2 hard cooked eggs
1 tbsp mayonnaise
½ stalk celery, chopped fine
⅛ tsp dry mustard
Dash paprika



Mix ingredients together in a medium bowl. Spread on breads and crackers.

Total servings: 1

Nutritional facts per serving (1 cup):

Calories: 240 kcal
Protein: 13 g
Sodium: 201 mg

Southwest Egg Burrito

1 large tortilla (use lowest sodium content)
2 eggs
1 tsp cooking oil
2 tbsp diced onions
2 tbsp red pepper, chopped into bitesize pieces
2 tbsp frozen corn niblets
2 tbsp shredded cheese
1 tbsp salsa
Optional protein booster: ¼ cup black beans (from can, rinsed prior to using)

Heat cooking oil in fry pan. Add diced onion and red pepper; cook until they softened (about 2 minutes). Add frozen corn kernels (and black beans) and cook until heated through. Whisk 2 eggs in a medium bowl then pour into the pan. Continue frying until the eggs are cooked. Transfer the cooked egg mixture to the center fold of the wrap and top with salsa. Roll the wrap up.

Total servings: 1

Nutritional facts per serving (1 burrito):

Calories: 443 kcal
Protein: 24 g
Sodium: 382 mg

Hummus

15 oz can chickpeas, rinsed
1 garlic clove
¼ cup olive oil
2 tbsp fresh lemon juice
2 tbsp tahini
1 tsp ground cumin
¼ tsp paprika

Add all ingredients to a food processor. Blend until the mixture has a smooth consistency. If it is too thick, add water as needed.

Total servings: 5

Nutritional facts per serving (½ cup):

Calories: 235 kcal
Protein: 8 g
Sodium: 260 mg

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Chicken Fried Rice

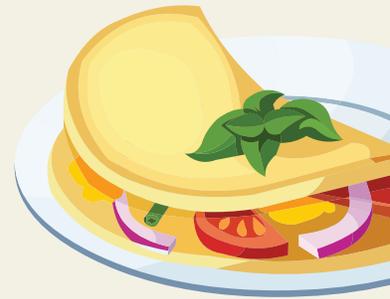
1 tbsp canola oil
1 tsp sesame oil (optional)
2 tbsp chopped white onion
½ cup frozen vegetable mixture (peas, corn, diced carrots)
1 cup leftover, cooked white rice
3 oz leftover, diced up cooked chicken
1 tsp reduced sodium soy sauce
1 tbsp water

Sauté onion in the mix of canola and sesame oil in a medium fry pan on medium heat for 1-2 minutes or until soft. Add frozen vegetables and cook until heated through. Add leftover rice and chicken, stirring them into the mix until the rice is broken up. Add reduced sodium soy sauce and water and stir. Cook for another 2-3 minutes and serve.

Total servings: 2

Nutritional facts per serving (1 cup):

Calories: 302 kcal
Protein: 19 g
Sodium: 137 mg



Cheese Omelet

2-3 eggs
¼ cup shredded mozzarella
1 spray of cooking spray

Beat 2 eggs in a medium bowl. Pour the mixture into a warmed and greased non-stick fry pan. Cook for ~1 minute. Sprinkle ¼ cup shredded mozzarella cheese over entire omelet. Cook on medium heat for another 1-2 minutes. Fold one half over to the other half. Cook another 2-3 minutes, flipping once.

Total servings: 1

Nutritional facts per serving (1 omelet):

Calories: 231 kcal
Protein: 17 g
Sodium: 233 mg

Fruit Smoothie

Blend together the following ingredients until the desired consistency is reached.

½ cup milk
½ banana
½ cup frozen fruit (any variety)
½ cup Greek yogurt

**Optional protein boosters – 1 scoop whey protein powder or ½ cup of canned then rinsed white kidney beans
**If too thick, add water or juice to dilute

Total servings: 1

Nutritional facts per serving (2 cups) with 1 scoop whey protein powder:

Calories: 385 kcal
Protein: 32 g
Sodium: 177 mg



Black Bean Soup

- 1 tbsp olive oil
- ½ cup chopped onion
- ½ cup quinoa or rice
- 2 cups chicken or vegetable broth (no-salt-added)
- 2½ lbs (40 oz or 2 large cans) black beans, rinsed
- 1tsp finely minced fresh garlic
- 1 tsp chili powder
- ½ tsp ground cumin
- ¼ tsp red pepper flakes
- 2 tbsp fresh cilantro, chopped
- 1 tbsp lime juice
- ½ cup unsalted tortilla chips
- ½ cup shredded cheddar cheese
- ½ cup plain yogurt or sour cream



Place the olive oil in a large saucepan over medium-high heat. Add the onion and sauté for 5-6 minutes. Add broth, black beans, quinoa, and garlic and bring to a boil. Cover and reduce heat so that the contents are simmering. Cook until the quinoa is tender, stirring frequently - about 14 minutes. Add the chili powder, cumin, and red pepper flakes. Purée the cooked mixture with a hand blender or cool slightly and purée in 2 batches using a blender or food processor. Return the soup to the saucepan over low heat. Stir in the cilantro and lime juice. Ladle the soup into wide-mouthed bowls and top with tortilla chips, cheddar cheese, and a dollop of yogurt.

Tip: Adding 2-3 tsp of unflavoured whey powder protein to each bowl provides 8-12 g of extra protein!

Total servings: 6

Nutritional facts per serving (1½ cups):

Calories: 487 kcal

Protein: 30 g

Sodium: 395 mg



5 Chapter

Using Meal Supplements

Using nutritional meal supplements can improve the diet by ensuring a variety of essential nutrients are consumed.

When choosing a meal supplement, it is important to find one that is suitable, tasty, and convenient.

When should meal supplement drinks be used?

Meal supplements can be used freely. For example, use after or instead of a meal if troubled by a poor appetite or getting full quickly. Meal supplements can also be snacks between meals.

To make a "small meal" more nutritious, consider:

- Replacing milk with a vanilla-flavored meal supplement when eating hot or cold cereal
- Adding a meal supplement to a fruit smoothie instead of juice or milk

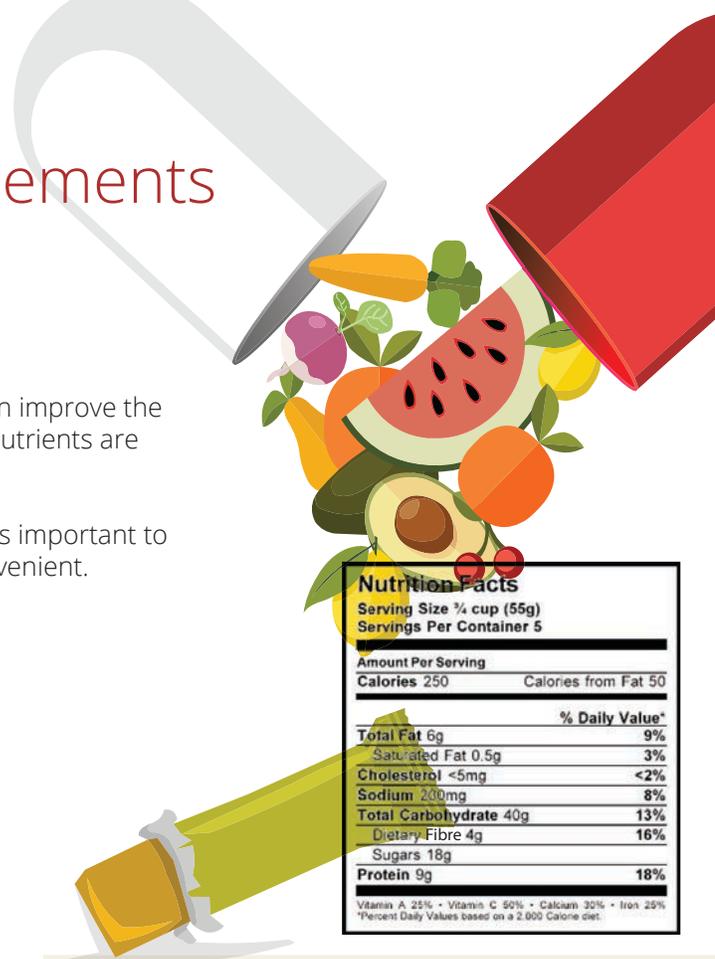
How can meal supplements be altered to taste better?

Sometimes, meal supplements may be too sweet or thick, or you are craving change in taste. Here are some suggestions:

- Mix chocolate or vanilla meal supplement with coffee or tea (hot or cold)
- Blend a sweet meal supplement with frozen fruit that is tart, like berries
- Pour the supplement into a glass and add ice
- Add the supplement to ice cube or popsicle trays and freeze it for a fun, refreshing alternative
- Dilute the supplement with other drinks: milk, soy or almond milk, or water

Using food labels to choose the best meal supplement

Check the "Nutrition Facts Label" for information about the calories, protein, and sodium per serving.



Nutrition Facts	
Serving Size ¼ cup (55g)	
Servings Per Container 5	
Amount Per Serving	
Calories 250	Calories from Fat 50
% Daily Value*	
Total Fat 6g	9%
Saturated Fat 0.5g	3%
Cholesterol <5mg	<2%
Sodium 200mg	8%
Total Carbohydrate 40g	13%
Dietary Fibre 4g	16%
Sugars 18g	
Protein 9g	18%

Vitamin A 25% • Vitamin C 50% • Calcium 30% • Iron 20%
*Percent Daily Values based on a 2,000 Calorie diet.



Some suggestions for choosing the best meal supplement

Energy/Calories:

- Meal supplement drinks range from 200 to 500 calories per drink
- If you have lost a lot of weight and muscle, choose a drink with 400 to 500 calories
- If your weight is stable or you are overweight, choose a drink with 200 to 250 calories

Protein:

- Most drinks range in protein from 9 to 20 g
- Aim to choose drinks that have 10 g protein or more in each bottle

Sodium:

- After choosing the best options for calories and protein, choose from the drink that has the lowest amount of sodium

Common nutritional meal supplement drinks

The table below highlights the available options as of March 2017. Remember to check the food label in case of manufacturer changes!

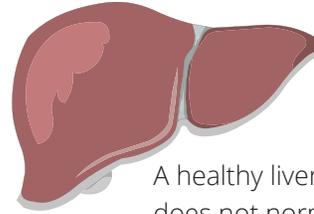
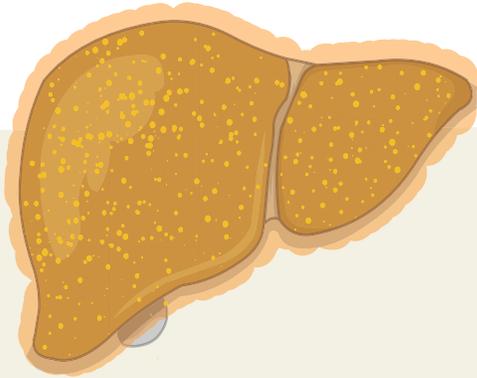
Remember that generic brands are usually less expensive than brand name products. Make sure to compare costs **and** nutritional content before purchasing!



Nutritional meal supplement	Serving size	Calorie (kcal)	Protein (g)	Sodium (mg)	Calcium (mg)	Highlights
Ensure® Regular	1 bottle (237 ml)	235	9.4	250 (10% DV)	300 (27% DV)	Maintain a healthy weight; increase energy; balanced nutrition for use between or with meals
Ensure® Plus Calories	1 bottle (237 ml)	355	14	250 (10% DV)	300 (27% DV)	50% more protein and 120 more calories per bottle than regular Ensure®; helps gain or maintain weight
Ensure® High Protein	1 bottle (237 ml)	225	12	290 (12% DV)	275 (25% DV)	For weight maintenance; provides 28% more protein than regular Ensure®
Ensure® Enlive®	1 bottle (235 ml)	350	20	240 (10% DV)	550 (50% DV)	Contains HMB (β-hydroxy β-methylbutyrate, a common dietary supplement) plus 20 g of protein; good for those recovering from malnutrition to help rebuild muscle tissues, strength, energy, and gain weight
Ensure® Compact	1 bottle (118 ml)	220	9	170 (7% DV)	330 (30% DV)	Good if a regular supplement drink is too filling or need a snack on the fly; is half the volume of other Ensure® drinks
Glucerna® (Ensure® for diabetes)	1 bottle (235 ml)	225	11	250 (10% DV)	275 (25% DV)	23 g available carbohydrates; good for diabetics and patients with NASH cirrhosis or who are overweight or obese
BOOST® Original	1 bottle (237 ml)	240	10	150 (6% DV)	330 (30% DV)	Use as a mini-meal or snack; has 10 g of high-quality protein
BOOST® High Protein	1 bottle (237 ml)	240	15	200 (8% DV)	385 (35% DV)	Nutritionally complete formula with 15 g of high-quality protein; use as a snack or meal; good for patients with a reduced appetite
BOOST® Diabetic	1 bottle (237 ml)	190	16	200 (8% DV)	280 (25% DV)	Nutritionally-complete formula designed for diabetes; contains 17 g of carbohydrates per serving
BOOST® Plus Calories	1 bottle (237 ml)	360	14	200 (8% DV)	385 (35% DV)	Concentrated source of calories in a small volume for patients with high energy needs
Carnation® Breakfast Essentials (Ready-to-drink or powder)	1 bottle (237 ml) Powder 1/3 cup (40 g)	Drink 240 Powder 150	Drink 10 Powder 7	Drink 265 (11% DV) Powder 115 (5% DV)	Drink 208 (28% DV) Powder 220 (20% DV)	Use as a snack or meal When mixed with milk, provides a source of protein and an excellent source of calcium, vitamin D, iron and vitamin C

Managing weight loss and cirrhosis at the same time

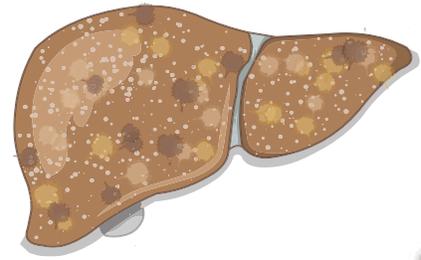
Yes, it is possible!



A healthy liver does not normally contain a lot of fat.

However, liver fat can accumulate in overweight or obese people or those who have diabetes or high blood pressure. This condition is called **non-alcoholic fatty liver disease (NAFLD)** and affects approximately 25% of adult North Americans.

In some patients with NAFLD, the liver fat is dangerous and causes inflammation and accumulation of scar tissues. This is called **non-alcoholic steatohepatitis (NASH)**. With the build-up of more and more scar tissues, NASH can progress to cirrhosis.



To effectively treat NAFLD and NASH, it is necessary to lose weight by adjusting eating habits and increasing physical exercise.

Losing just 5-10% of current measured weight reduces the symptoms and severity of NASH and NAFLD, and improves liver health!

 **Tip**
When losing weight, make small changes that can be easily maintained over a long time.

 **Tip**
Losing weight too quickly can be bad for the liver. Aim to lose approximately 1 lb per week.

 **Tip**
Ask your healthcare practitioner or dietitian what your weight loss target is and how many calories per day you should be eating. If your weight has been stable to start with, a useful target is to decrease your caloric intake by ~ 500 calories per day.



Has my healthcare practitioner advised me to lose weight?

- Yes No

How much weight have I been advised to lose?

How much do I weigh now?

My Weight:

Date:



** Remember, there are online applications to track calories you eat in a day. See chapter 2 for more details.

Regardless of body size, you must continue eating well to prevent muscle loss and malnutrition in cirrhosis.

To maintain muscle strength and assist the liver, **protein intake must be maintained** even when intentionally losing weight.

It **is** possible to meet protein goals while trying to lose weight by choosing high protein foods that are low in fat:

- Lean cuts of meat, or extra lean ground meats
- Skinless poultry
- Low fat or skim dairy products
- Beans, peas, and lentils
- Fish – baked or grilled
- Tofu
- Eggs – poached and boiled
- Protein powder

Make sure to review Chapter 2 to determine your daily protein requirement using your ideal body weight.



What other things can I do to help my liver and lose weight?

1) Reduce the amount of saturated fats

Saturated fats can increase the amount of fat in the liver and make diabetes control worse.

CHOOSE

Lean meats

Make sure to trim all visible fat before cooking!

Skinless poultry

Skim and low-fat dairy products, such as 1% milk, 0% fat yogurt, reduced-fat cheeses

Cooking methods: baking, boiling, or grilling

Cooking oils: olive oil, canola oil, soybean oil, peanut oil, or soft margarine made from the above oils

Fresh fruits and vegetables for snacks

AVOID/LIMIT

Ribs, bacon, store bought hamburger patties, and other fatty cuts of meat

Poultry with skin on

High fat dairy products like cream cheese, regular sour cream, ice cream, creams, and butter.

Frying, deep frying, and any fried foods

Cooking with lard, butter, palm and coconut oil, baking margarine

Baked goods, including pastries, cakes, cookies, doughnuts, and muffins

2) Limit indulging in sugary foods and drinks

- Excess sugar is converted into fat worsening fatty liver disease and causing weight gain
- Added sugar should be less than 5-10% of the total energy per day
- As part of a 2,000 calorie per day diet, sugar intake should be no more than 25-50 g
- Check the Nutrition Fact Table on the food labels to learn the total sugar content per serving



3) Keep moving! Keep active!

In cirrhosis, it is important to participate in regular exercise to prevent muscle loss. When trying to lose weight, exercise helps to burn calories and build muscles.

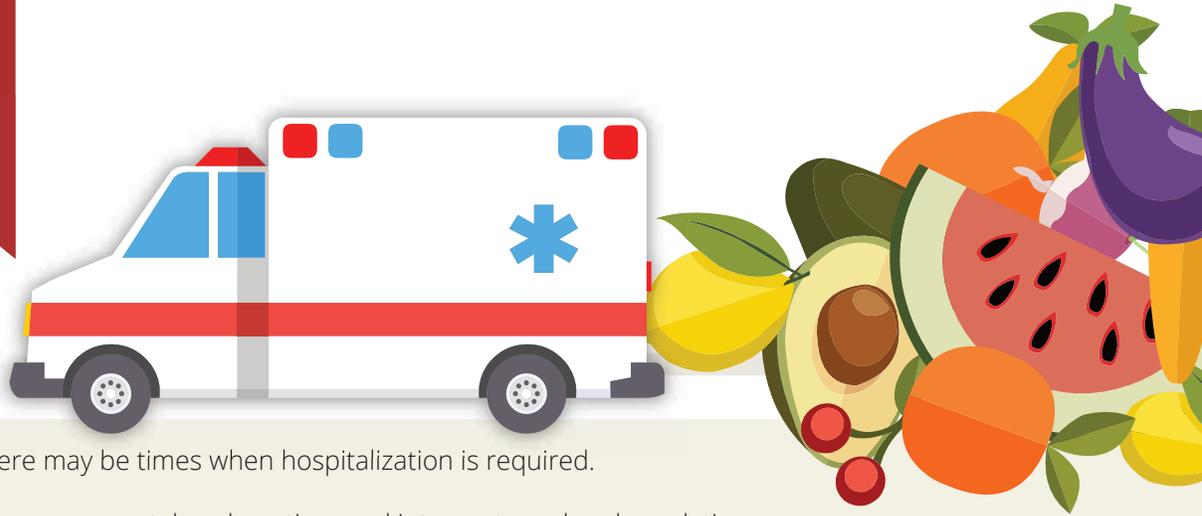
Set a realistic goal for exercise and stick to it!

"I will walk for 30 minutes per day, for 5 days of the week."

My exercise goal is to:



What to expect in the hospital?



In cirrhosis, there may be times when hospitalization is required.

The admitting process can take a long time and interrupt meal and snack times. You may also be required to fast for several days in advance of a procedure.

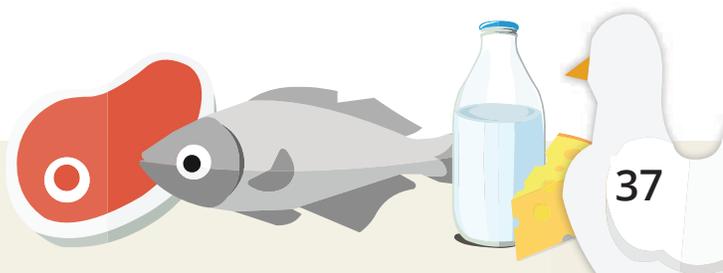
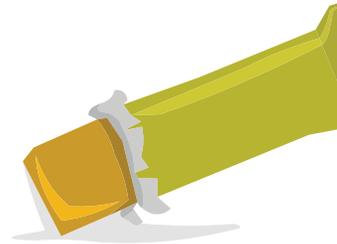
Not eating for more than 8 hours increases the risk for unwanted weight and muscle mass loss. Here are several helpful strategies:

1) What can I do?

- Bring snacks to eat during your hospital stay
- Ask the nursing staff when and what you are allowed to eat
 - ask often since this is important!
- Request that snacks be provided between meals and before bedtime
- Ask to see a dietitian
- If you are put on a "Clear Fluids Diet", ask medical staff if meal supplements can be added
- Let the nurses and dietitian know which high-protein foods you prefer eating
- If you are allowed to eat but are not hungry, ask to see the dietitian who can provide suggestions
- Ask for meal supplements and store in the nightstand until you are ready to drink them

2) What can my healthcare team do?

- a) Provide meal supplements
 - These can be used to replace meals or be eaten as snacks between meals
- b) Add high-protein foods or beverages to your meal tray, such as:
 - Double portions of meat
 - Yogurt, milk, or cheese to meals and snacks
 - Request extra items stored in the ward to access at your convenience



c) Your healthcare team may prescribe a tube feed or intravenous nutrition if you are unable to eat enough food. This could be due to poor appetite or a medical issue.

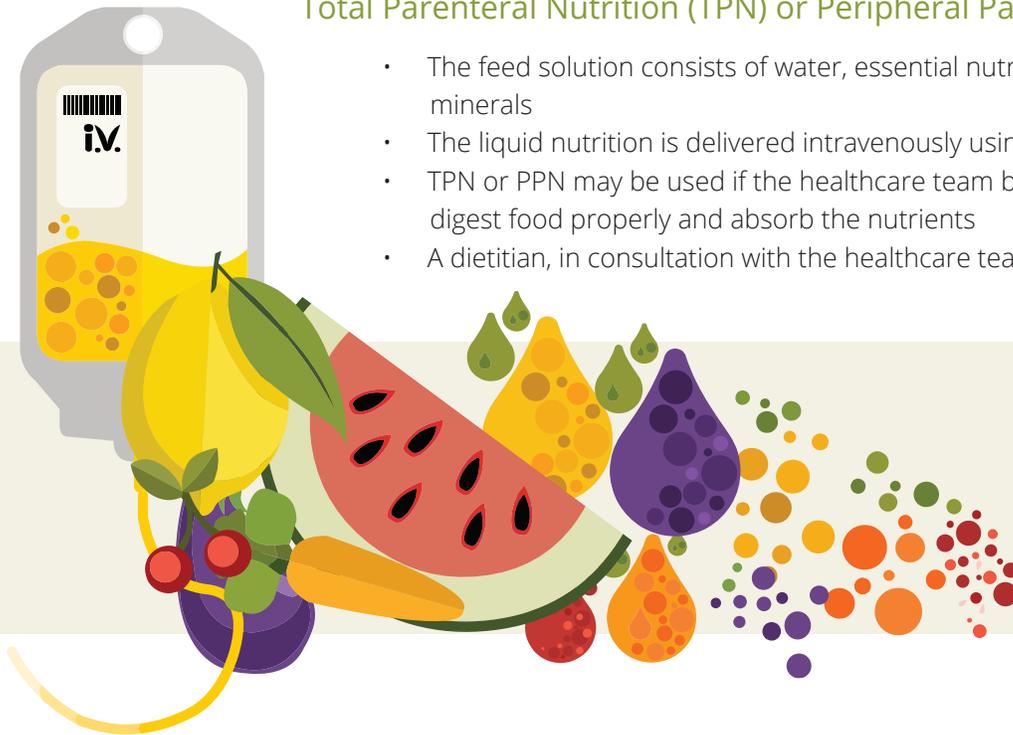


Nasogastric (NG) Feed

- The dietitian prescribes the tube feed
- A thin, flexible tube is placed into the nose extending down into the stomach
- A pump slowly drips a liquid of concentrated nutrients through the tube
- Unless advised by your healthcare practitioner, in most cases you can and are allowed to eat solid foods with this type of tube feed
- The feed runs 24 hours a day, but can be changed based on your nutrition requirements and how well you tolerate the feeds. For example, you may need it only during certain times during the day or night.

Total Parenteral Nutrition (TPN) or Peripheral Parenteral Nutrition (PPN)

- The feed solution consists of water, essential nutrients as well as vitamins and minerals
- The liquid nutrition is delivered intravenously using a vein in the arm
- TPN or PPN may be used if the healthcare team believes that you are unable to digest food properly and absorb the nutrients
- A dietitian, in consultation with the healthcare team, will prescribe this



d) Your healthcare team can also provide prescriptions for vitamin and mineral supplements.

- It is quite common to be prescribed a multivitamin tablet, calcium, and vitamin D while in hospital and at home following discharge.



Notes

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