



# Nutritional Considerations for a NASH Related “Chronic Liver Disease Patient” - A Case Report

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## Abstract

This report discusses the nutritional considerations and management of a chronic liver disease patient (Non-Alcoholic Steato Hepatitis) and the role of nurses to look after the specific dietary requirements while providing care to the patient. It focuses on nursing care with emphasis on dietary considerations which were followed for the patient for duration of one week (9.10.23 to 13.10.23) when he was hospitalized at a tertiary Care Super specialty Liver hospital. During the patient evaluation and diagnosis, the high scores of prognostic markers as CTP & MELD suggested that this patient had undergone extensive liver damage. Protein Calorie malnutrition is common to all forms of Chronic Liver disease. Early identification and management of the micro and macro nutrients deficiency is to be done to reduce complications. Hence, dietary management is one of the significant areas to be closely monitored and managed to aid in recovery and management of the liver damage and in improving general wellbeing of the patient..

**Keywords:** Nutritional Needs; Chronic Liver Damage; Hepatitis B; MELD; CTP; NASH

## Abbreviations

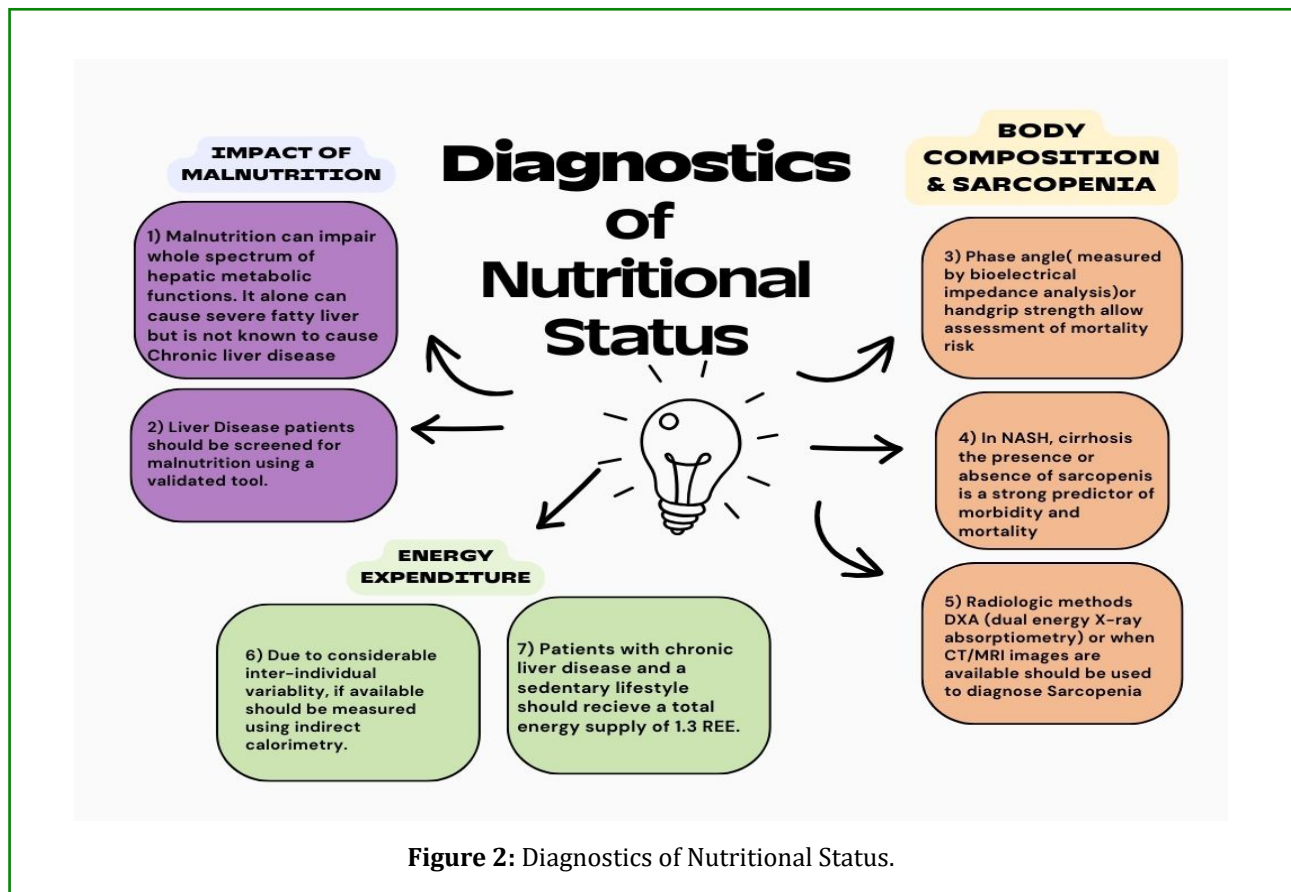
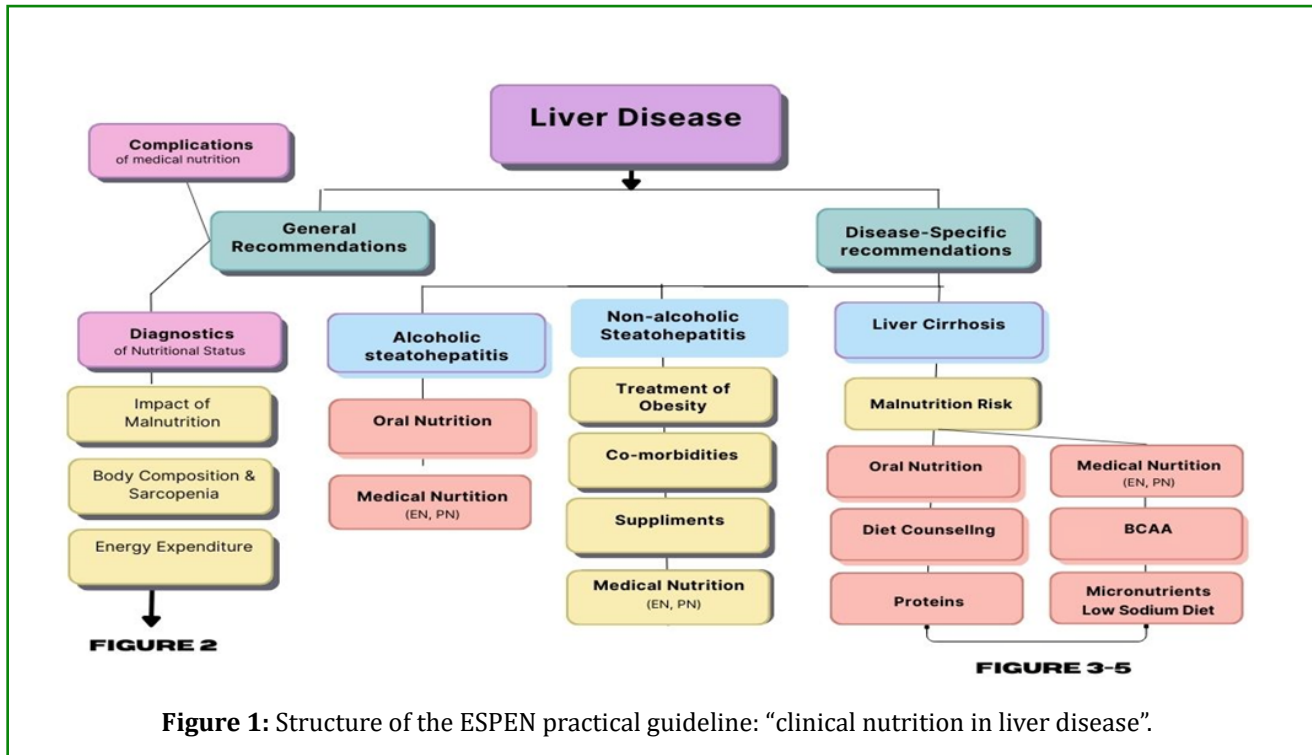
NASH: Non-alcoholic Steatohepatitis; EVL: Endoscopic Variceal Ligation; HVPG: Hepatic venous Pressure Gradient.

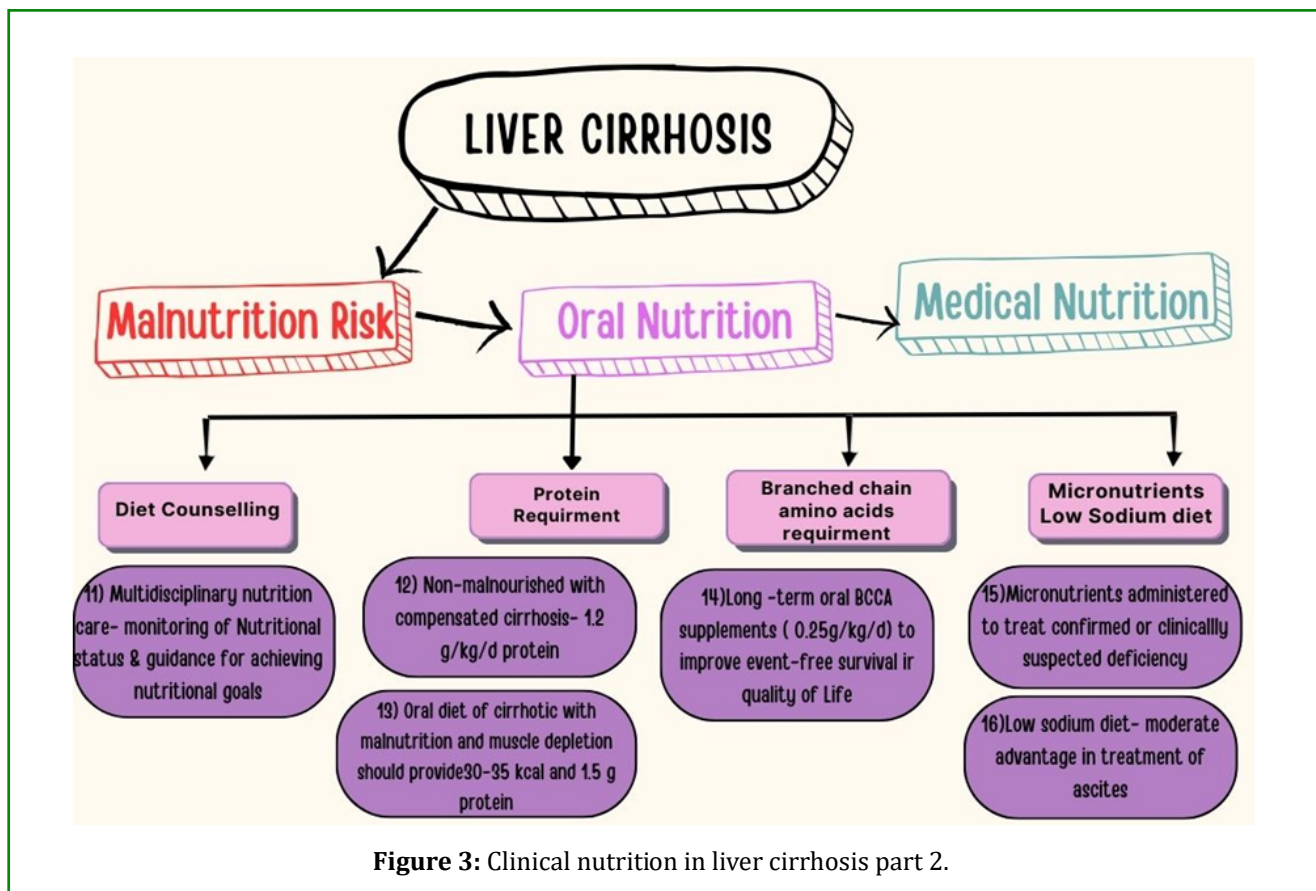
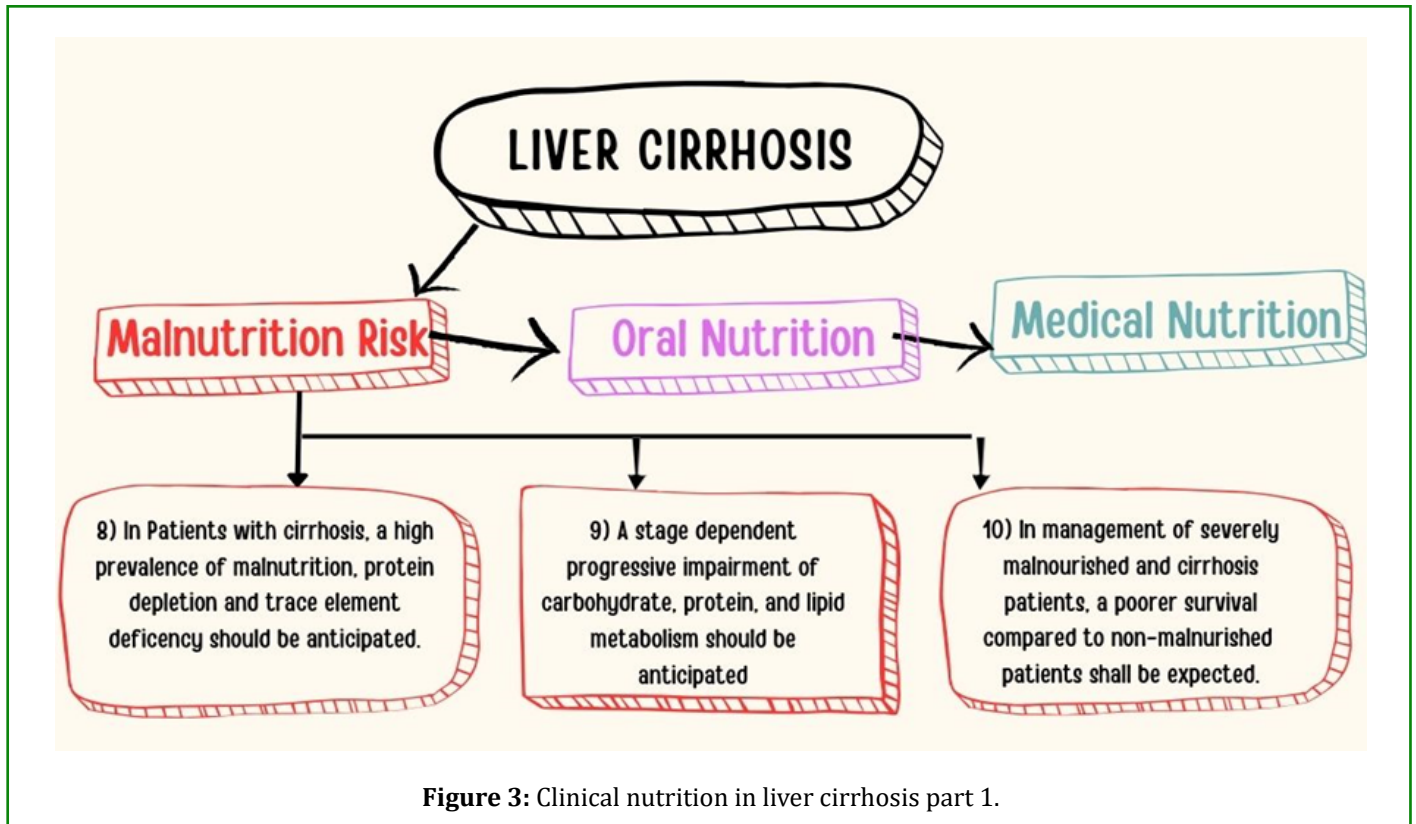
## Introduction

### Nutritional Considerations in patients with Chronic Liver Damage

It is well documented and known fact that nutrition plays a central role in the prognostic and therapeutic treatment of chronic liver diseases, irrespective of its etiology. The

Figure 1 below demonstrates the role of clinical nutrition and recent shortened guidelines by ESPEN [1]. In this, nutritional considerations in all the major liver disorders are being explained including - Acute liver failure, chronic liver failure - alcohol dependent, Non-alcoholic steatohepatitis, liver transplant and surgery along with specific figures. The relevant figures explaining the nutritional considerations have been explained below (Figures 1-5). The Figure 2 depicts the diagnosis of nutritional problem based on Impact of malnutrition on liver disease, malnutrition risk and sarcopenia and energy expenditure. Figure 3-5 explains the malnutrition risk and what all deficiencies can be expected in a liver cirrhosis case.





## Need of the Study

This paper discusses the nutritional considerations and management for a Chronic liver damage patient with a case report of Non-alcoholic Steatohepatitis (NASH). Due to the extensive damage and decompensated state in chronic liver damage the patient's nutritional status specifically needs to be paid attention to. It plays a pivotal role in recovery of patient. There are very few research articles written on this. There is a severe deficiency of thiamine, vitamin B12, Folic Acid, Retinol, Vitamin K, Vitamin D, Zinc, Selenium and magnesium due to Decreased intake, decreased absorption, Reduction of the hepatic reserves. Vitamin D reserves may also be decreased due to Reduction of the exposure to UV light [2-4]. Overly restrictive diets often with sodium restriction, frequent paracentesis and drugs as diuretics, lactulose can lead to nutritional deficiencies [5]. The impaired digestion due to portal hypertension, producing changes in the intestinal mucosa or due to blood loss due to bleeding can lead to increased protein loss [6-8]. Impaired liver hydroxylation in its active metabolite Alcohol intake prevents the metabolization in its active substrate which Impairs liver hydroxylation in its active metabolite. Treatment with Diuretics may also reduce magnesium reserves [9].

## Discussion of Case

Patient first visited CMC Vellore in 2008 with complaints of Abdominal pain and was diagnosed as Liver Cirrhosis. He did not develop any major problems and was managed on OPD basis. In, April 2016, he visited the Liver hospital with chief complaints of Urinary Tract Infection for which he was managed symptomatically and abdominal distension. He was started on diuretics. In 2018 patient visited with complaints of Malena for which he was started on regular Endoscopic Variceal Ligation (EVL) sessions. He was managed as CLD likely NASH related and subsequently discharged.

Then in 2023, patient was admitted with dysuria along with high grade fever and chills. Patient presented with history of gradually progressing abdominal distension for about 6 months and recently had shortness of breath on routine activities. He c/o moderate intermittent fever with malaise for several days and pedal edema. He developed Portal Hypertension, Small Esophageal varices last EVL session was on 06.06.2023. Hepatic venous Pressure Gradient (HVPG) was found to be 22 mm Hg. There is no h/o vomiting, cough, altered bowel habits, hematemesis, Malena, burning micturition, or decreased urine output. There is no h/o any intoxications, indigenous medications, blood transfusions or IV drug abuse prior to onset of the disease. There is no evident history of HTN/CAD/TB/COPD/Thyroid disorders.

## Medical Management of the Case in Hospital

The patient was managed with Antibiotics -Injection Cefepime x 1 gm x IV x BD, Tab Ursocol x 450 mg x PO x BD, Efezac 1 sachet x PO x BD, Laxopeg 1 sachet x PO x TDS, Novasure Powder x PO x OD, Tab Rifagut x 550 mg x PO x BD, Tab TAF x 25 mg x PO x OD, Hepamerz infusion IV x 15 gm @ 2.1 ml/h, 5 % Albumin X 50 ml x OD. All the clinical parameters of the patient were within normal limits. On doing head to toe assessment of the patient there was no significant abnormality which was noticed.

## Diet Order

Before deciding on the diet, it is very significant to assess the level of Patient's activity. The patient was doing morning and evening walk for 15 min. In the hospital also he was maintaining moderate level of activity. The present patient was able to consume the diet orally, thus a Normal Diet order was being maintained in the hospital with the dietary modifications of - 2100 kcal / day + 90 grams protein / day. Low salt diet (< 2 grams / day) and Novasure Powder BD. He was able to take diet orally and no feeding assistance was required.

## Dietary History

Consistency: Present. Portion: Regular, Food preferences: Non-Veg, Dal, vegetables, rice, curd, fruits. Food dislikes: Bitter Gard, ladyfinger Food allergies: Nothing significant, Appetite: fair and Fluid intake: 2-3 liters of water.

## Clinical Signs for Establishing any Signs of Vitamin and Mineral Deficiency

Hair: Thick, no grey hairs were present. Mouth: Dry tongue, for the Eyes: dark circles observed under lower eyelids, sclera is slightly yellowish in colour, Nails: Normal, no sign of cyanosis, koilonychias and capillary refill is <3 sec, Skin: Icterus, Thyroid: Normal, no sign of goiter. All the Reflexes were Present, Bony deformities: Absent, Fatigue: present and there were no evident signs of Fluid deficit in body.

## Assessment of Physical health of the patient

Height =170 cm, weight = 66.2 kgs, BMI= 22.8 ( within normal range ), change in the weight – patient lost 1 kg weight in the last two months and had no dental caries present. There was no chewing or swallowing problem in the patient.

## Per Abdomen Examination

**On Inspection:** distended abdomen, umbilicus central and inverted, no visible venous prominences, no visible pulsations,



**On Palpation:** soft, non-tender, liver palpable, spleen palpable, no guarding, no rigidity, no rebound tenderness was noticed and

**On Percussion:** free fluid was not present.

**On Auscultation:** normal bowel sounds present

Mouth sores: Absent, Pallor: slightly present, Nausea: Absent, Vomiting: Present Diarrhea: Absent Constipation: Absent Stool colour: pale, Urine colour: Dark yellow. Bedsores: Absent Malnutrition: Absent Skin integrity: Intact Clubbing - present Dehydration risk: Present, Muscle wasting: Mild muscle wasting, Ankle oedema: Absent, Vision impairment: Not present, Hearing impairment: Absent.

### Diagnostic Workup done for the Patient

Initial lab data shows - Hb/PCV/TLC/PLT- 7.2/ 21.0/2.34/ 140, B.U/S.Cr-7/0.85 with Na/K/Cl-131.4/ 3.41/ 100.8. LFT showed T.Bil(T/D/1) - (2.30/1.20/1.10), AST/ALT- 27/9, ALP/GGT-40/ 16, S. Alb/S. Globulin-2.9/4.1, PIVKA S.iron/ UIBC/TIBC/ Trans- 33.7/ 320.5/354.2/9.45, Ferritin 42, HbCore Reactive\*, Testosterone level:- 1.35, BNP- 599.5, CPK-27, Lipid profile chol/LDL-15/51, HBA1C-6.3, Thyroid; T3/T4/ TSH 110/ 7.09/2.15. The diagnostic work up demonstrates that the values were altered. He also underwent Upper Gastrointestinal Endoscopy which show Small HR esophageal varices with EVL on 09/10/23 with no post procedural complications. HVPg done on 10/10/23 show

HVPg of 22mmHg with PCW of 15 and PA 18mm of Hg. DEXA Scan show Osteopenic T score. CXR was normal. CECT whole abdomen showed cirrhotic liver with grade 2 ascites with no SOL/PVT and presence of porto-systemic shunts. During stay in the hospital, he was managed with IV antibiotics, IV albumin, nutritional therapy and other supportive measures. The nature of the disease and its prognosis was explained in great detail to the patient and his attendants. He recovered symptomatically following the management and now he is being discharged in stable hemodynamic state with advice of follow up in OPD. Patient and attendant counseled for need of liver transplantation. No Liver Transplant donor is available at present.

### 24-hour Recall Method for Eliciting Nutrition Assessment

Using 24 hours recall method the details of the diet given during hospital Stay was elicited to know the level of nutritional status of the patient. In this all the Food or Beverage Items for every meal and snacks during the 24 Hour period, including water, tea, coffee, any vitamin or mineral supplements was included. The portion size included all fine details as no. of pieces, slices, servings, packets, ounces, pounds, teaspoons or tablespoons. The preparation method includes the way it was prepared – baking, boiling or steaming Table 1.

Food or Beverage Items	Portion size	Method of preparation	Added to preparation
Morning snacks	Tea	Boiled	Milk, sugar
Breakfast	1 cup Poha, 1 cup daliya, 1 cup milk with 1 scoop Nova powder	Boiled milk Toasted breads	1 scoop Nova Source powder in milk
Lunch	2 Rotis, 1 bowl vegetable curry ½ bowl curd Khidhi ½ bowl	Boiled khichdi, Fried vegetables	One pinch Salt
Afternoon snack	2 Banana With coconut water	Washed and peeled off skin.	Nil
Evening snacks	1 cup soup	Boiled	Salt and pepper
Dinner	3 Rotis, 1 bowl curry, ½ bowl dal, vegetable salad	Dry Roasting on heat, boiling and steaming, stir fry	Salt, condiments to taste

**Table 1:** Details Of Dietary intake by the patient using 24 hours Recall method.

### General Instructions for Meals after Discharge

The patient was asked to take Small frequent meals, 6-8 times daily. Take an early breakfast and include a bedtime snack such as milk, sweet or dessert. Do not skip meals or eat large quantities at once. No feasting and no fasting. Regular physical activity as tolerated. Keep emphasis on protein rich foods such as milk & milk products, allowed nuts and dal. Do not replace these foods with fruits, juices or salads etc. Avoid extra table salt, pickles, chutneys, processed items, cheese,

salted butter, Chinese food, fizz drinks (soft drinks, soda, Eno etc), canned foods and bakery items (biscuits, faans, puffs etc).

He was also explained the list of food allowed as in Cereals – all, Pulses- all, Milk and Milk products – Cow milk mainly as desserts, Curd, Paneer , Rasgulla etc. can be taken. In eggs he can take egg white. In meats – Fish and chicken and in vegetables and fruits – all can be consumed. In nuts – Almonds,

resins, walnuts and dates can be taken. The Daily Food Allowance with the measured quantities of carbohydrates,

fats, vitamins and minerals was also explained to the patient.

Daily Allowance of food groups with household measuring and quantities		
Food Group	Quantity	Household measure
Cereals/Pulses	200 gm/60 gm	8 servings/2 katori
Milk and milk products	750 ml	3 glass liquids
Egg	3	2 egg white, 1 whole egg
Vegetables	400 g	2 katori sabji + salad
Fruits	150 - 200 g	1-2 medium sized
Fats	30 g	6 teaspoon
Sugars	20 gm	4 teaspoon
Nuts	10 gm	8 pc almonds / 3 walnuts/ 5 resins
Paneer	50 gms	5-6 slices

**Table 2:** Meal planning for the patient post discharge.

Sample Menu to follow after discharge from hospital was explained to him as in terms of quantities. In terms of nutrients may not be understandable thus in terms of items

and their quantities to be taken were also simultaneously explained.

<b>Morning (6: 00 am)</b>	Lemon water, 8 pc almonds/ 3 walnuts + resins, walk for 20 mins, Egg whole 1
<b>Breakfast (9:00 am)</b>	Daliya/ oats – 2 med katori, Or ( dal/veg) chapati 2 / Idli / upma / chilla Milk 1 glass / curd 1 katori
<b>Mid-morning (11: am)</b>	Fruit + Lassi 1 glass / Shake
<b>Lunch (2:00pm)</b>	Chapati – 3, Vegetable – 1 katori / Daliya/ oats Curd - 1 katori Salad 1 plate, Dal – 1 katori, Walk after half hour for 20 minutes
<b>Evening (4:00 pm)</b>	Butter milk 1 glass/ lassi Sprouts/ roasted chana/makhana, 2 egg white
<b>Dinner (7:30pm)</b>	Chappati – 2 Vegetable - 1 , atori, Paneer 50 g, Curd, salad 1 plate,Walk after half hour for 20 minutes
<b>Bed time (10:00 pm)</b>	Dessert / Milk /Kheer / halwa / chena / sponge rasgulla

**Table 3:** Sample menu to be followed post discharge as explained to the patient.

### Role of Nurses in Maintaining Nutritional Health of the Chronic Liver Damage Patient

The nurses working in liver units need to be sensitized on significance of nutritional considerations for individuals with chronic liver disease related to Hepatitis are essential to support liver function, manage symptoms, and improve overall health.

**Advocate Patients to Maintain a Healthy Weight:** Aim for a stable and healthy weight to prevent malnutrition or obesity, both of which can worsen liver function.

**Increase Protein Intake in Diet if the patient:** Consume high-quality protein sources to support liver function and prevent muscle wasting. Good sources include lean meats,

poultry, fish, eggs, dairy products, legumes, and tofu.

**Assisting Patients to Select Carbohydrates Wisely:** Choose complex carbohydrates like whole grains, fruits, vegetables, and legumes. Monitor carbohydrate intake, especially if the individual has diabetes, as managing blood sugar levels is crucial for liver health.

**Encouraging Patients to Include Healthy Fats:** Include sources of healthy fats, such as avocados, nuts, seeds, and olive oil. Limit saturated and trans fats found in processed foods, fried foods, and fatty cuts of meat.

**Advising to Limit Sodium Intake in the Diet of the Patients:** Reduce salt intake to help manage fluid retention and minimize the risk of complications like ascites. Avoid processed foods, canned soups, and salty snacks.

**Emphasize on consuming Vitamins and Minerals on daily**

**basis:** Ensure an adequate intake of vitamins and minerals, including vitamin D, vitamin K, and B-complex vitamins.

**Maintain Fluid balance:** Monitor fluid intake, especially if there is edema. Individual fluid restrictions may be necessary based on the severity of liver disease and the presence of complications.

**Counselling to Stop Alcohol Intake:** Counsel and advise to avoid alcohol completely, as it can exacerbate liver damage.

**Advocating to Manage Blood Sugar Levels within normal limits:** If diabetes is present, work on managing blood sugar levels through a balanced diet, regular physical activity, and medication as prescribed.

**Advising patients to Include food items with Omega-3 Fatty Acids:** Consider incorporating omega-3 fatty acids, found in fatty fish, flaxseeds, and chia seeds, as they may have anti-inflammatory benefits.

**Emphasize on taking Small, Frequent Meals:** Consume smaller, more frequent meals throughout the day to support digestion and reduce the burden on the liver.

## Summary

As a Hepatology Nurse, it is vital to acknowledge the importance of dietary factors in liver illnesses for effective patient care. The selection of foods one consumes has a crucial impact on the management of liver problems, given that the liver plays a vital role in both metabolic and detoxifying processes. Optimal Nutrient Ratio, Minimizing Exposure to Hepatotoxic Substances, Controlling Metabolic Syndrome, Limiting Sodium Intake, Supplementation of Vitamins and Minerals, Customized Dietary Plans with Dieticians and effective patient education are integral components of providing comprehensive care for individuals with advanced liver disease.

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