1. Introduction

1.1 This clinical guideline will outline the nutritional optimisation procedure for those who have been diagnosed with chronic liver disease which can be defined as a progressive deterioration of liver functions for more than six months, which includes synthesis of clotting factors and other proteins, detoxification of harmful products of metabolism, and excretion of bile.

1.2 The aims of this clinical guidance are:

1.2.1 To define the procedure for providing optimal and appropriate nutritional and dietary care for adult inpatients' with chronic liver disease, which include nutritional support, therapeutic diet secondary to ascites or steatorrhea.

1.2.2 To reduce the patient risk of malnutrition, improve quality of care by standardising nutritional care in adult inpatients' with chronic liver disease.

1.2.3 Provide advice on initiating nutritional management of adult inpatients' with chronic liver disease at ward level, primarily within gastroenterology medicine/hepatology wards on and during admission to Leicester Royal infirmary, but may also include inpatients' on other wards across University Hospitals of Leicester (UHL) NHS Trust.

1.3 This clinical guideline **does not** cover inpatients that have acute liver disease (fulminant hepatic failure). These patients should be referred directly to the ward Dietitian via the electronic referral system Integrated Clinical Environment (ICE) where appropriate.

2. Scope

2.1 This clinical guideline is to be used by the all clinicians to enable them to initiate optimal nutritional care on an adult (over 16 years old) that has chronic liver disease.

3. Recommendations, Standards and Procedural Statements

3.1 All patients must be screened for malnutrition risk as per the findings of the Department of Health (2014) and the 'National Institute for Health and Care Excellence (2012) Nutrition support in adults', which was updated in 2020. The Malnutrition Universal Screening Tool (MUST) is the validated nutritional screening tool used in UHL hospitals. For further details see the Trust's Policy on 'Nutritional Screening and First Line Oral Nutritional Care Policy for Adults' (Trust reference B26/2015).

3.1.1 In this patient group dry weight is required when calculating Body Mass Index (BMI) to avoid inaccurate MUST scoring. Dry body weight is the patient weight minus the estimated fluid weight from their ascites and/or peripheral oedema (see appendix 4).

3.2 The Royal Free Hospital Nutrition Prioritizing Tool (RFH-NPT) has been developed as a screening tool for malnutrition in liver disease patients. In comparison, the Royal Free Hospital Nutrition Prioritizing Tool was more sensitive than the Nutritional risk Screening 2002 to identify liver patients at risk for malnutrition (ESPEN 2020). After reviewing the MUST and RFH-NPT, it was found that despite the high sensitivity of the RFH-NPT; the limited dietetic resources at UHL would make it difficult to implement in both an inpatient and outpatient setting.

3.3 Individuals with a diagnosis of chronic liver disease are frequently under-nourished (Silva et al., 2015). Due to this, re-feeding problems can occur when initiating nutrition in this group of patients. Therefore, it is important to identify and treat appropriately as per the University

Hospitals of Leicester Trust policy 'Guideline for the Clinical Dietetic Management of Adult Inpatients at Risk of Refeeding Syndrome' (Trust reference C55/2015).

3.3.1 Feeding without adequate thiamine can lead to Wernickes Encephalopathy. Wernicke-Korsakoff Syndrome is seen particularly frequently in those who drink alcohol in excess, may have low liver stores of thiamine. It can occur in any patients with chronic vomiting including those with hyperemesis gravidarum and gastric outlet obstruction.

3.4 A patient who has a diagnosis of chronic liver disease should be referred directly to the Dietitian via ICE referral system in the following circumstances:

3.4.1 The patient is for enteral nutrition.
3.4.2 The patient has had **NO** nutritional intake for more than 10 days.
3.4.3 The patient reports food allergies or food hypersensitivity/intolerances.
3.4.4 Patient requires assessment and provision of a therapeutic diet as highlighted in appendix 1
3.4.5 Acute liver disease (fulminant hepatic failure).

3.5 The European Society for Clinical Nutrition and Metabolism (ESPEN) Practical guideline: Clinical nutrition in liver disease (2020) suggests that phase angle (measured by bioelectrical impedance analysis) or handgrip strength allows for assessment of mortality risk and/or complications. In non-alcoholic steatohepatitis (NASH), cirrhosis and liver transplantation it is suggested that sarcopenia should be assessed as it is a strong predictor of mortality and morbidity (ESPEN 2020). Radiological methods (dual energy X-ray absorptiometry (DEXA) or when CT/magnetic resonance tomography (MRT) images are available for other reasons) should be used to diagnose sarcopenia (Ali et al., 2022).

3.6 Patients with liver disease have a high probability of developing diabetes (Hickman & Macdonald). These patients will likely be on a form of medication such as insulin. It is important to note that this group of patients are also at risk of malnutrition. The "Nutrition and Dietary Management of Adult Inpatients with Diabetes UHL Guideline" (Trust ref: B56/2019) recommends patients who are malnourished or at risk of malnutrition should not be restricted in their choice of meals or snacks and can choose any item from the menu Oral nutritional supplements (e.g. Fortisip) or high energy meals should not be stopped due to high blood glucose levels. Diabetes medication should be adjusted by the medical team or the IrDT to aim for the patient's target glucose control level.

3.7 The procedure for implementing the nutritional care pathway for adult inpatients' with chronic liver disease (Appendix 1) is tabled below. It details actions to be taken, who is responsible for ensuring it is actioned and the rationale for this.

Process for Nutritional management of chronic liver disease		
No.	**Action**	**Responsibility**
1	Adult inpatients diagnosed with chronic liver disease (compensated or decompensated) that are for active medical treatment should be commenced on the first line nutritional care plan (appendix 2) as indicated in the Nutritional Care Pathway flowchart (see Appendix 1).	Medical team and Nursing staff
2	A printed copy of the appendices 1, 2, 3, 4, and 5 must be placed in the nursing notes.	Nursing staff
3	It must be clearly documented on Nervecentre in the nutritional status box that the patient has been placed on the "Nutritional Care Pathway for Adult Inpatients' with Chronic Liver Disease".	Medical team and nursing staff
4	Estimated dry body weight after each time a patient is weighed (must be twice weekly) using appendix 3 to aid in the estimating dry weight and appendix 4 to document dry weight.	Medical team and nursing staff

Process for Nutritional management of chronic liver disease		
5	If any of the criteria in the 'KEY POINTS' section of the Nutritional Care Pathway for Adult Inpatients' with Chronic Liver Disease (see Appendix 1) are met, the patient must be referred to the ward Dietitian immediately via the electronic referral system ICE.	Medical team and nursing staff
6	For individuals with one or more of the following: ascites, oesophageal varices, hepatic encephalopathy, steatorrhea; follow the specific dietary advice for these symptoms as indicated in the Nutritional Care Pathway for Adult Inpatients with Chronic Liver Disease (see Appendix 1).	Medical team and nursing staff
7	Nurses should review food charts on Day 4 using Appendix 5: Food Record Chart 'Ready-Reckoner and refer to the Nutritional Care Pathway for Adult Inpatients' with Chronic Liver Disease (see Appendix 1) to determine what action needs to be taken. - If the individual has a poor intake or nasogastric (NG) tube feeding is indicated, a referral to the Dietitian via the electronic referral system must be made - If the individual has a good intake, current care should continue. This should be repeated on Day 7 and every 3 days thereafter.	Nursing staff
8	If patient is for nasogastric (NG) tube feeding refer to 'Out of Hours Enteral Tube Feeding (Nasogastric) Adults UHL Guideline' (Trust reference B55/2006) and ensure referral to Dietitians using the ICE referral system.	Medical team and nursing staff
9	Discharge Planning: - If a patient has been prescribed oral nutritional supplements a 3 day supply should be provided with TTO's (or up to 7 days based on ward Dietitian advice). - The diet sheet "Nutritional Support for Liver disease" if not already issued by a Dietitian should be given found on Your Health Leicester. - If patient is for Hepatology Consultant follow-up on discharge and remains under the Dietitian with clinical concern, the patient will be offered an opt-in appointment in to the dietetic gastroenterology-medicine outpatient clinic. - If they are not for Hepatology Consultant follow-up and there are on-going nutritional concerns refer to Primary Care via patient's GP on discharge letter.	Medical team, nursing staff and Dietitians

4. Education and Training

4.1 Dietitians should ensure healthcare professionals e.g. Hepatology medical teams and nursing teams on appropriate units/ward are aware of this Clinical Guideline.

4.2 Dietitians should lead on training and education of appropriate individuals on the use of this clinical guideline through ward based training/education.

4.3 Dietitians can use this to aid student dietetic training for those who undergo their clinical placement as part of their undergraduate degree to become a registered Dietitian.

5. Monitoring Compliance

What will be measured to monitor compliance	Method	Frequency	Monitoring Lead	Reporting arrangements
Patient has been commenced on the Nutritional care pathway (appendix 1) timely and have a completed care plan in place from admission	Audit	2 yearly	Dietitian/ Hepatology research nurse	To be reported at educational section of gastroenterology consultant meeting
Oral Nutritional Supports has been prescribed appropriately based on estimated dry weight	Audit	2 yearly	Dietitian in Hepatology area	To be reported at educational section of gastroenterology consultant meeting
Individuals are provided with the Bedtime snack menu for patients with liver disease and are offered a 50g carbohydrate snack before bed	Audit	2 yearly	Dietitian in Hepatology area	To be reported at educational section of gastroenterology consultant meeting
Patients are having the handgrip strength completed by Dietitian at initial assessment and reviews	Audit	2 yearly	Dietitian in Hepatology area	To be reported at educational section of gastroenterology consultant meeting

6. Supporting Documents and Key References

Ali, S.H., Sneinehm A.A., Hasweh, R. (2022) Nutritional assessment in patients with liver cirrhosis, World Journal of Hepatology, 18 (9): 1694-1703

Bischoff, S. C., Bernal, W., Dasarathy, S., Merli, M., Plank, L. D., Schütz, T., Plauth, M. (2020) ESPEN practical guideline: Clinical nutrition in liver disease, *Clinical Nutrition* 39 (2020) 3533-3562

Department of Health. (2014) The Hospital Food Standards Panel's report on standards for food and drink in NHS hospitals

Elia, M (2005) The 'MUST' Report - Nutritional screening of adults: a multidisciplinary responsibility (Executive Summary), *British Association for Parenteral and Enteral Nutrition (BAPEN)*

Hickman IJ, Macdonald GA. (2007) Impact of diabetes on the severity of liver disease. Am J Med. Oct;120(10):829-34. doi: 10.1016/j.amjmed.2007.03.025. PMID: 17904449.

Mafrici, B., Cope, J., Culkin, A., Judges, D., Soulsby, C., Weekes, E. (2018) A Pocket Guide To Clinical Nutrition - 5th Edition.

National Institute for Health and Care Excellence. (2012) Nutrition support in adults. NICE Quality Standards (QS24)

National Institute for Health and Care Excellence. (2006) Nutrition support in adults. NICE guideline (CG32).

Silva, M., Gomes, S., Peixoto, A., Toress-Ramalho, P., Cardoso, H., Azevedo, R., Cunha, C., Macedo, G. (2015) Nutrition in Chronic Liver Disease, Portuguese Journal of Gastroenterology, 22 (6): 268-276

University Hospitals of Leicester (2021) Nutrition and Dietary Management of Adult Inpatients with Diabetes UHL Guideline. Trust ref: B56/2019.

University Hospitals of Leicester. (2023) Nutritional Screening and First Line Oral Nutritional Care Policy for Adults UHL Guideline. Trust reference B26/2015.

University Hospital of Leicester (2023) Out of Hours Enteral Tube Feeding (Nasogastric) Adults UHL Guideline' Trust reference B55/2006.

University Hospitals of Leicester. (2024) Guideline for the Clinical Dietietic Management of Adult Inpatients at Risk of Refeeding Syndrome. Trust reference C55/2015.

7. Key Words

Nutrition, Dietetic, liver disease, nutritional care pathway

This line signifies the end of the document

DEVELOPMENT AND APPROVAL RECORD FOR THIS DOCUMENT		
Author / Lead Officer:	Celina Duchesne	**Job Title:** Senior Dietitian
Reviewed by:		
Approved by:	**Clinical Policy and Guideline Committee**	**Date Approved: 10.10.24 v3**

REVIEW RECORD			
Date	**Issue Number**	**Reviewed By**	**Description Of Changes (If Any)**
		Celina Duchesne #	1. Definition added to clarify chronic liver disease 2. Add information on the RFH-NPT 3. Process table updated to reflect appendices 4. Two actions removed due to similar to another 5. Monitor and audit updated; refeeding audit removed as this would be better suited in the refeeding policy/guideline and replace with liver disease related monitoring needs 6. 3.6 has been added to highlight diabetes among liver disease and signpost to UHL guideline Trust ref: B56/2019 7. Removed references that were not referenced in body of text 8. Appendix 1 updated, Aymes shake replaces Fortisip Compact protein in line with the first line nutrition pathway 9. Appendix 1 updated to include Diabetes, signpost to guideline B56/2019 10. Appendix 2 updated to reflect above supplement changes 11. Bedtime snack menu removed and signposted to the catering folder. Bedtime snack menu likely to be updated frequently. 12. Appendix 6 Information for adult patients with Liver Disease How to Reduce the Salt in Your Diet removed as new diet sheet "Nutritional Support for liver disease" is now published. 13. Appendix 5 has been replaced with the food record chart 'ready reckoner'

		Kiran Rehman	1. Reviewed literature of text and inputted relevant references 2. Revised reference list to up to date references 3. Updated all dates of University Hospital of Leicester guidelines and policies 4. Condensed and rearranged the text to make it more concise and relevant

DISTRIBUTION RECORD:			
Date	**Name**	**Dept**	**Received**

Appendix 1: Nutritional Care Pathway for an Inpatient with Chronic Liver disease

University Hospitals of Leicester NHS
NHS Trust

Insert Trust Ref number here

Adult patient admitted with chronic liver disease (compensated or decompensated)

Is patient for active medical treatment?

- No → **Do not** refer to Dietitian's. Do not commence nutritional care

- Yes →

All Patients (first line nutritional care plan) (Appendix 2)

1) Encourage high calorie menu options (menu code), good sources of protein e.g. fish, meat, beans, lentils and snacks
2) Offer Aymes shake* drink (no need to prescribe). Shakes are ordered from catering.
   Patient dry weight <60kg = 57g Aymes shake make with 200mls whole milk BD
   Patient dry weight ≥60kg = 57g Aymes shake make with 200mls whole milk OD
   3) Offer 50g carbohydrate snack before bed (see ward catering folder)
4) Commence 3 days of food record charts
5) Weigh patient at least twice weekly and estimate dry weight (Appendix 3 and 4)
6) Follow specific advice for symptoms e.g. ascites, encephalopathy, varices, steatorrhoea

Screen for risk of re-feeding syndrome (See guideline B55/2006 appendix two)

Nursing staff to review food charts after 3 days. Refer to 'Ready Reckoner' (Appendix 6)

Refer to Dietitian to assess need for NG feeding if <u>poor intake</u> e.g.:
- less than half meals eaten and/or
- Aymes shake and bedtime snack declined

DO NOT refer to Dietitian if <u>good intake</u> e.g.:
- more than half meals eaten
- taking Aymes shakes and
- having snack before bed

Continue current care

If at risk or high risk of re-feeding syndrome

1. See "Guideline for the Clinical Dietietic Management of Adult Inpatients at Risk of Refeeding Syndrome" (Trust reference C55/2015) on what vitamins to prescribe.
2. Refer to Dietitian if at **high risk** of re-feeding syndrome

<u>MEDICAL TEAM</u>

Check blood potassium, phosphate and magnesium levels and, if indicated, correct as per UHL policy.

<u>KEY POINTS</u>

Please refer directly to the Dietitian (via ICE) if: -

- The patient is for nasogastric (NG), percutaneous endoscopic gastrostomy (PEG), radiological inserted gastrostomy (RIG) or jejunostomy feeding (including if required due to encephalopathy or has oesophageal varices)
- The patient has had **<u>NO</u>** nutritional intake for more than 10 days
- The patient reports food allergies or hypersensitivity
- Specialist advice is required following diagnosis, or a full nutritional assessment is required in response to clinical judgement (i.e. steatorrhoea, high risk-of feeding syndrome)
- Patient requires assessment and provision of a therapeutic diet e.g. metabolic
- Acute liver disease (fulminant hepatic failure)

*Contraindications to the use of Aymes shakes drinks include: intravenous use (not for intravenous administration), lactose intolerance, milk and soya allergy and galactosaemia. In this case, please refer to the Dietitian.

Ascites

1) No added salt diet – choose from hospital menu
   NO SOUP OR CRISPS ALLOWED
2) Daily body weights
3) Ensure any fluid restriction is adhered to (unless severely malnourished and receiving extra oral nutritional supplements as discussed with Consultant and Dietitian)
4) Provide "Nutritional Support for liver disease" diet sheet found on YourHealth on discharge.

Oesophageal varices:
Evidence suggests fine bore NG feeding is not contra-indicated – medical team to consider if required & refer to dietitians.

Steatorrhoea:
Please refer to Dietitian for therapeutic advice.

Encephalopathy:
Consider state of confusion and NG feeding and refer to Dietitian if required.

Diabetic:
Oral nutritional supplements (e.g. Aymes) or high energy meals and bedtime snack should not be stopped due to high blood glucose levels. See guideline B56/2019

Appendix 2: First Line Nutritional Care Plan Nutritional Care Pathway for Adult Inpatients with Chronic Liver Disease

University Hospitals of Leicester NHS
NHS Trust

Insert Trust Ref number here

Patient Information sticker

Patient name:

Hospital number:

DOB:

Ward:

Date commenced _____

Day 1 of admission to unit/ward	Outcome (Yes/No)	Date & Time	Signature & Initials
Offered Aymes Shakes (57g) from ward kitchen (non-prescribable product)			
Offered 50g carbohydrate snack before bed (see ward catering folder)			
Weight measured			
Dry weight estimated (see Appendix3)			
Commenced food charts			
Re-feeding syndrome risk assessed by medical team			
No soup/ crisps enforced if applicable (e.g. ascites)			
Day 4 of admission to unit/ward			
Food charts reviewed by nurses (Appendix 5: Food Record Chart 'Ready-Reckoner' can be used to aid this)			
If less than half meals eaten and / or Aymes Shakes, bedtime snacks are declined, refer to Dietitian			
Day 7 of admission to unit/ward			
Food charts reviewed by nurses			
If less than half meals eaten and/or Aymes Shakes and bedtime snack declined, referred to Dietitian			

Continue as per day 4 and 7 of care plan during inpatient stay.
NB: If the individual is for artificial/tube feeding e.g. nasogastric (NG), please refer to the Dietitian via the electronic referral system.

A dry body weight is the patient weight minus the estimated fluid weight from their ascites and/or peripheral oedema.

When considering the offering/prescribing of Aymes Shakes and when calculating Body Mass Index (BMI) to assess nutritional status, it is important to use the individual's dry body weight. The following table provides a useful summary for estimating dry body weight for individuals who present with ascites and/or oedema. For dry body weight, subtract fluid weight of ascites and/or oedema from measured weight.

This table provides a guide only and in severe ascites or oedema, there may be an under-estimate of the amount of fluid. It is important to use weight histories or previous post-paracentesis weights where appropriate to estimate dry body weight more accurately.

Table 1: Likely fluid weights for ascites and oedema

Guide for assessing weight of:-	Ascites	Peripheral oedema
Minimal	2.2kg	1.0kg
Moderate	6.0kg	5.0kg
Severe	14.0kg	10.0kg

Extracted from Mafrici et a. (2011) A Pocket Guide to Clinical Nutrition (5th edition), Section 2: Assessment, p2.4, Table 2.2.

Worked Example

Measured weight = 75Kg

On observation/ discussion with Medical Team individual has moderate ascites and a minor amount of bilateral leg oedema.

Estimated fluid weight = 6.0Kg (ascites) + 2.0Kg (oedema) = 8.0Kg

Estimated dry weight = 75Kg (measured weight) – 8.0Kg (estimated fluid weight) = 67Kg

Appendix 4: Recording Weight for Adult Inpatients with Chronic Liver Disease

University Hospitals of Leicester NHS
NHS Trust

Insert Trust Ref number here

Patient Name: **Hospital Number:** **NHS No:** **Site:** **Ward:**

WEIGHT CHART

Frequency (please tick): Once a day ☐ Twice a week☐ Once a week☐
Days:

Signature & (Print name):

Job Title:

Date & Time	Type of scales used	Measured weight (kg)	Estimated fluid weight (kg)	Estimated Dry weight (kg)	Hand grip strength** (kg)	Clothing detail	Signature & job title
Example: 13.09.24 15:38	*chair*	*66*	*6*	*60*	*18.7 weak*	*Hospital gown*	*CD - Dietitian*

*E.g. Stand-on/Seated/Hoist Scales. Readings are more accurate if the same scales used each time

** Only use if training has been given and competent on using the dynamometer (hand grip strength measurement).

FOOD RECORD CHART 'READY-RECKONER' FOR WARD STAFF

You should be concerned about a patient meeting their nutritional requirements if the food record chart shows:

1. One or more mealtimes over the course of the day where nothing is eaten (including refusal of meals)
2. No main course option is order/eaten (e.g. a pattern of only eating soup and a pudding)
3. No hot main course is eaten during the day and no extras (snacks/milky drinks) between meals
4. Only the main course is eaten with no starter, pudding or extras (snacks/milky drinks) between meals
5. Less than three quarters of each component to the meals eaten and no extras (snacks/milky drinks) between meals
6. Less than half of each component to the meals eaten
7. If a snack box is being used regularly as a meal replacement
8. Limited variety of food being eaten (e.g. foods from each of the food groups should be included over the course of the day)

If any of these are occurring consistently, the patients nutritional care plan needs to be reviewed and extra nutritional measures considered.

Careful observation is particularly required for patients on a low fibre, vegan, modified-texture or chylothorax menu.

Assessment of food record charts should be made alongside review of patients weight and using clinical judgement.

FOOD	Estimated Energy	Estimated Protein
Soup	150kcals	3.5g
Main dishes	400kcals	15g
Energy dense meals	500kcals	20g
Asian Vegetarian dishes	350kcals	15g
Chapati	300kcals	9g
Jacket potato meal	400kcals	15g
Salad meal	450kcals	15g
Sandwiches	400kcals	15g
Snacks	100kcals	2g
Hot dessert with custard	350kcals	4g
Cold dessert	100kcals	3g
Cheese and crackers	150kcals	6g
200mls Whole milk	130kcals	7g
Aymes shakes made as directed	383kcals	19g