What To Do Prior to Referral For Liver Transplant

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Conflict of Interest Disclosure

No relevant relationships with any commercial or non-profit organizations

CanMEDS Roles Covered

	Medical Expert (as *Medical Experts*, physicians integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional values in their provision of high-quality and safe patient-centered care. *Medical Expert* is the central physician Role in the CanMEDS Framework and defines the physician's clinical scope of practice.)
	Communicator (as *Communicators*, physicians form relationships with patients and their families that facilitate the gathering and sharing of essential information for effective health care.)
	Collaborator (as *Collaborators*, physicians work effectively with other health care professionals to provide safe, high-quality, patient-centred care.)
	Leader (as *Leaders*, physicians engage with others to contribute to a vision of a high-quality health care system and take responsibility for the delivery of excellent patient care through their activities as clinicians, administrators, scholars, or teachers.)
	Health Advocate (as *Health Advocates*, physicians contribute their expertise and influence as they work with communities or patient populations to improve health. They work with those they serve to determine and understand needs, speak on behalf of others when required, and support the mobilization of resources to effect change.)
	Scholar (as *Scholars*, physicians demonstrate a lifelong commitment to excellence in practice through continuous learning and by teaching others, evaluating evidence, and contributing to scholarship.)
	Professional (as *Professionals,* physicians are committed to the health and well-being of individual patients and society through ethical practice, high personal standards of behaviour, accountability to the profession and society, physician-led regulation, and maintenance of personal health.)

Session Learning Objectives

1) Assessment of Liver Disease Severity

- Inpatient Transplant Referrals
  - Acute and Acute on chronic liver failure
  - Severe alcoholic hepatitis
- Outpatient Referrals
  - MELD score utilization

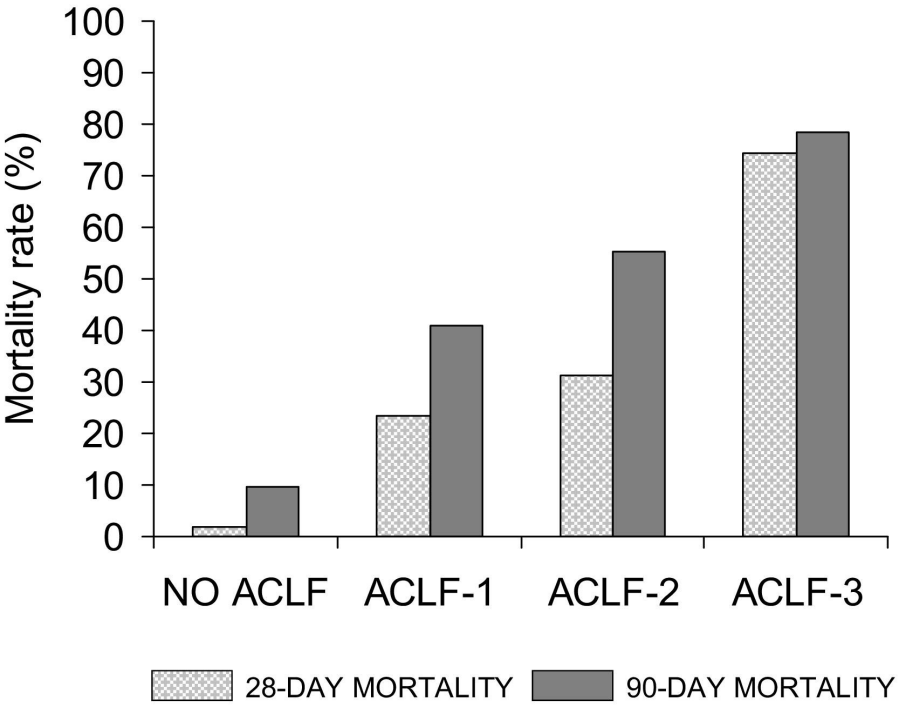
2) Identifying Contraindications to Liver Transplantation

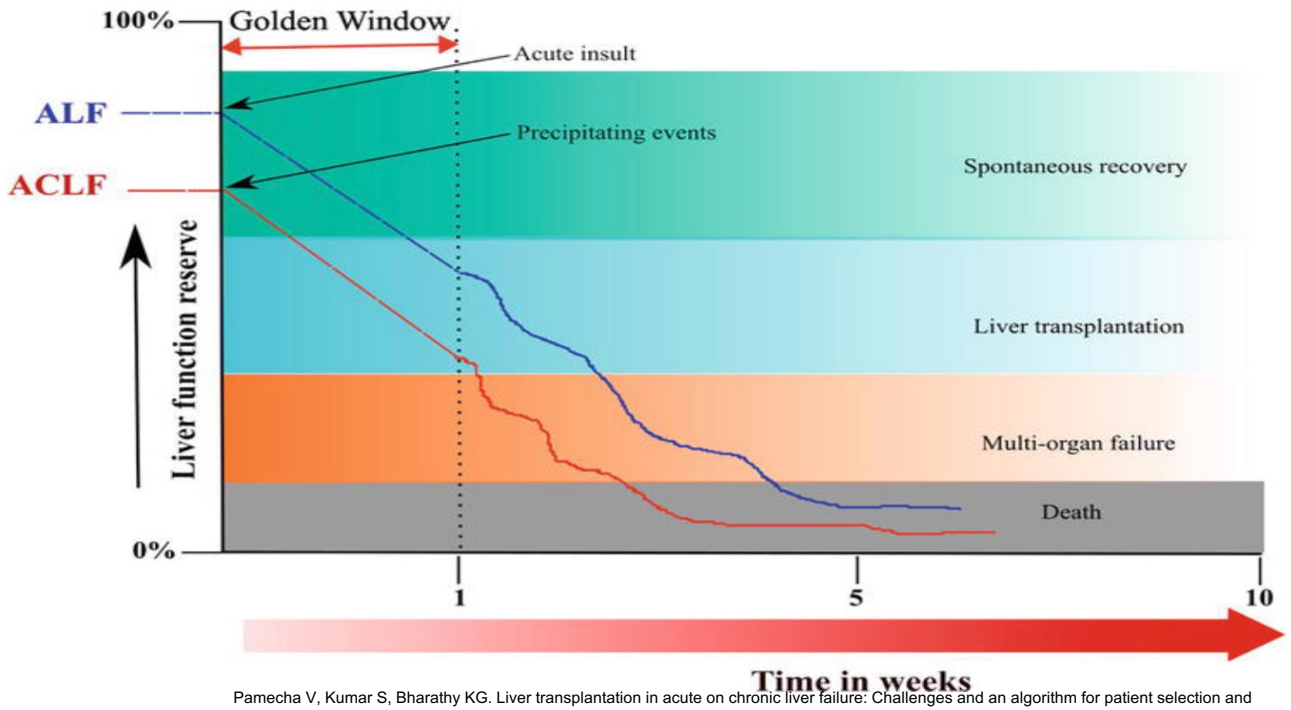
3) Routine investigations to send with your transplant referral

4) Pre-Transplant optimization and patient education

When to Consider an Inpatient Referral for Liver transplantation

Acute on Chronic Liver Failure (ACLF)





Pamecha V, Kumar S, Bharathy KG. Liver transplantation in acute on chronic liver failure: Challenges and an algorithm for patient selection and management. Hepatology International. 2015;9(4):534-542

ACLF Definition: Acute liver injury in patient with chronic liver disease PLUS at least one more extrahepatic organ failure* (neurological, circulatory, respiratory, or renal)

*Organ failures are defined by the European Association for the Study of the Liver Chronic Liver Failure Consortium (CLIF-C) OF score

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The Following Are To Be Done On Admission and Daily in All ALF Cases
Neuro check every 1-2 hours
Head of the bed at 30°
Head in neutral position
Minimize stimulation (tracheal suctioning, chest physiology, sternal rubbing)
N-acetylcysteine (NAC) IV until INR < 1.5 or resolution of encephalopathy*
CXR and surveillance culture (blood, urine, sputum) on admission and every 24-48 hours
Monitor blood glucose ever 1-2 hours
Avoid nephrotoxic drugs (aminoglycosides, NSAIDs, neomycin, etc.) and IV contrast
DVT prophylaxis with sequential compression stockings despite coagulopathy; avoid heparin
PPI for stress ulcer prophylaxis
Communication: 1. Intensivist and/or transplant hepatologist 2. Nurse 3. Patient's family

Transplant Eligibility in Acute Alcoholic Hepatitis

Adherence to the 6-month rule is not associated with superior patient survival, allograft survival, or relapse-free survival among appropriately selected patients

Typical Medical Inclusion Criteria

I. First episode of alcoholic hepatitis and refractory to steroid therapy

II. No prior knowledge of alcohol related liver disease

III. No medical, psychiatric or surgical contraindication to LT

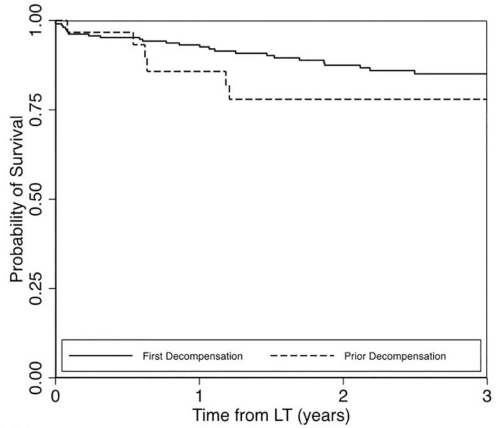
Associated Challenges

I. Psychosocial evaluation is completed as inpatient where encephalopathy or withdrawal symptoms among other challenges may be present

II. Family members may paint a favorable picture of the patient or not engaged at the time of evaluation

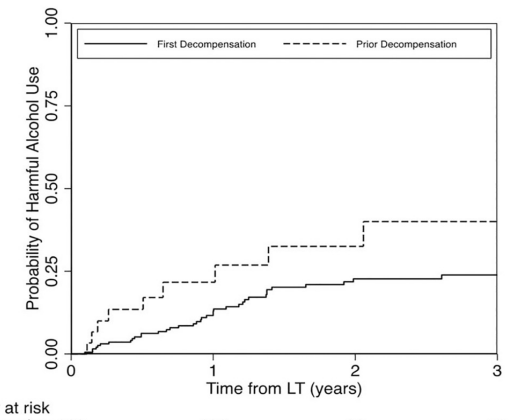
Study	# of LT	Age	Male	Abstinence prior to LT	MELD at LT	1 year survival	Relapse
France-Belgium 2011	26	47	58%	<90 days	34	77%	10%
Mount Sinai 2015	9	41	56%	33 days	39	89%	12.5%
John Hopkins 2016	17	50	77%	40 days	38	100%	24%
Accelerate-AH 2017	147	53	73%	55 days	39	94%	17%

Figure 1. **Probability of survival after LT among first vs prior liver decompensation**



Probability of survival after LT among first vs prior liver decompensation groups.

Figure 2. **Probability of harmful alcohol use after LT among first vs prior liver decompensation**

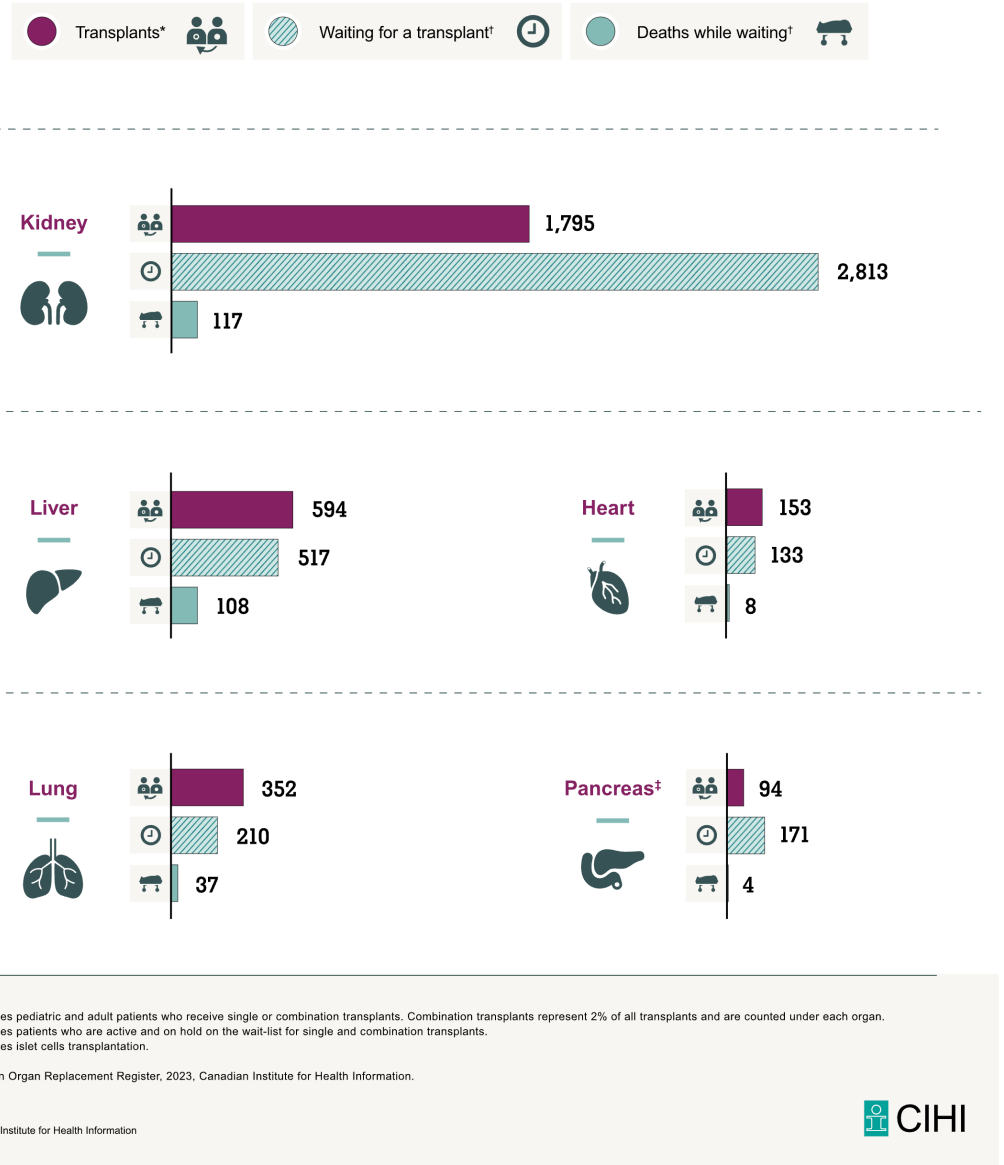


Probability of harmful alcohol use after LTamong first vs prior liver decompensation groups. LT, liver transplantation.

Am J Gastroenterol. 2022 Dec 1; 117(12): 1990–1998.

Outpatient Referrals

- What is the MELD-Na score?
  - Typical Listing MELD is 15
- Any complications not reflected by the MELD score?
  - Hepatocellular carcinoma?
  - Recurrent cholangitis (PSC)?



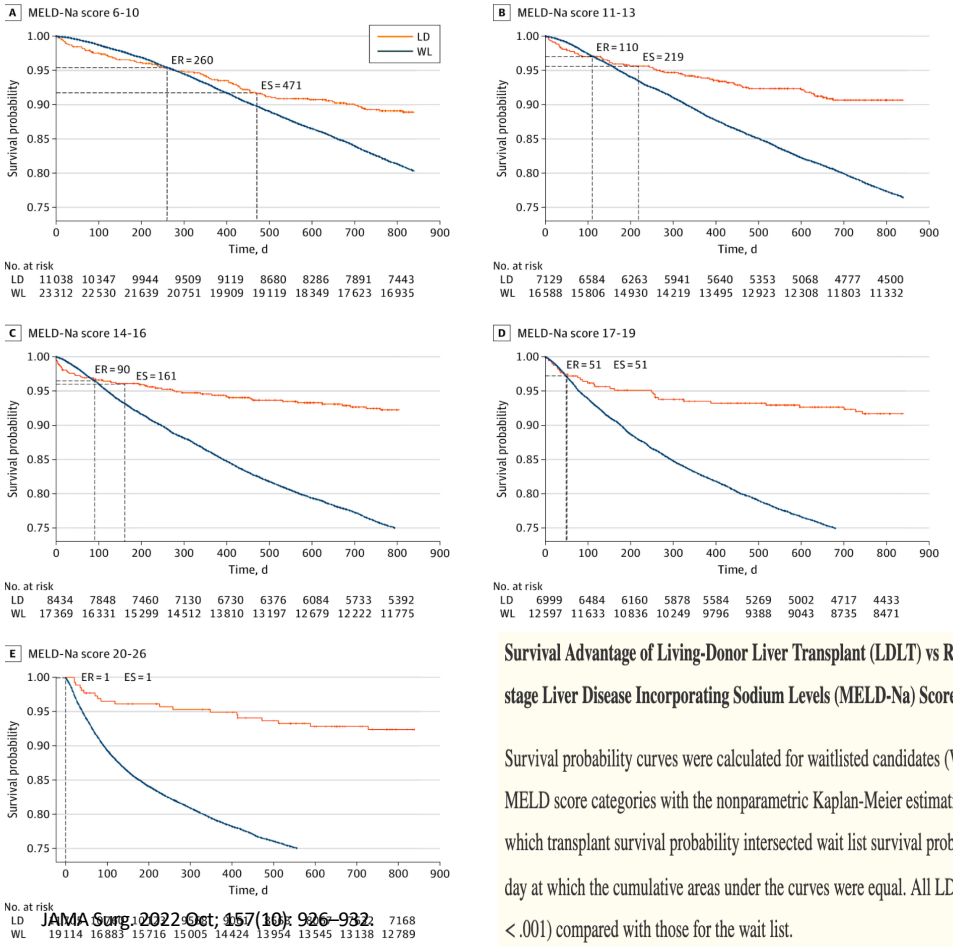
Notes
* Includes pediatric and adult patients who receive single or combination transplants. Combination transplants represent 2% of all transplants and are counted under each organ.
† Includes patients who are active and on hold on the wait-list for single and combination transplants.
‡ Includes islet cells transplantation.
Source
Canadian Organ Replacement Register, 2023, Canadian Institute for Health Information.

CIHI

Survival Advantage of LDLT vs Waitlist Mortality

Conclusion and Relevance

LDLT is associated with a survival benefit for patients with a MELD-Na score as low as 11



Survival Advantage of Living-Donor Liver Transplant (LDLT) vs Remaining on the Wait List Across 5 Model for End-stage Liver Disease Incorporating Sodium Levels (MELD-Na) Score Categories

Survival probability curves were calculated for waitlisted candidates (WL) and patients receiving an LDLT (LD) across 5 MELD score categories with the nonparametric Kaplan-Meier estimation. Time to equal risk (ER) was reported as the day at which transplant survival probability intersected wait list survival probability. Time to equal survival (ES) was reported as the day at which the cumulative areas under the curves were equal. All LDLT survival curves were statistically significant ($P < .001$) compared with those for the wait list.

JAMA Surg. 2022 Oct; 157(10): 926–932.

Contraindications

Absolute
Severe, irreversible co-morbid medical illness that adversely impacts short-term life expectancy
Severe pulmonary hypertension (mean pulmonary artery pressure (PAP) ≥ 50 mmHg)
Extrahepatic Malignancy (excluding some skin cancers)
Extensive hepatocellular carcinoma or with macrovascular or lymph node invasion
Uncontrolled systemic sepsis
Inadequate social support
Active drug abuse
Unacceptable risk of recidivism
Severe uncontrolled psychiatric disease

Relative
Advanced age (>70 years)
Active alcohol use*
Cholangiocarcinoma*
Moderate pulmonary hypertension (mean PAP between 35 and 50 mmHg)
Severe hepatopulmonary syndrome with PaO2 ≤ 50 mmHg
Severe obesity (body mass index ≥35)
Extensive Portal Vein and Mesenteric Vascular thrombosis
HIV/AIDS*
Advanced Malnutrition, deconditioning

*Considered within a clinical trial or protocol

Phase II		Selected	Test/Procedure
Radiology		X	Doppler ultrasound to assess portal vein patency
	X		MRI/MRV/MRCP or triple phase CT of Liver
	X		EKG
	X		Bone density
	X		Chest X-ray: PA & lateral
		X	Chest CT (if patient with HCC) rule/out metastasis
		X	Bone Scan (if patient with HCC) rule/out metastasis
Cardiology See flowsheets under "Pre-Transplant Cardiac Evaluation" Protocol	X		Bubble 2D ECHO • If abnormal wall motion: stress test and cardiology consultation • Elevated Pulmonary Artery Systolic Pressure (>35mmHg) -> consider direct to RHC if no other testing abnormalities, or Cardiology consult
	X		Electrocardiogram (EKG)
		X	Stress test (Dobutamine stress echo or Pharmacological nuclear stress test) - for all patients age 50 and older or cardiac history/risk factors*. *Cardiac risk factors: • Tobacco • Hyperlipidemia • Diabetes mellitus • Hypertension • Male gender • S/P menopause • Family history of premature CAD
		x	Coronary CTA (contraindicated in patients with abnormal renal function, GFR < 50) – In certain patients, can be considered prior to cardiology consult for any patient whose Echocardiogram and Stress Test are both normal: • Patient with significant cardiac risk factors* or; • Any patient age 60 or older with NASH, or; • Any patient age 65 and older with 2 or more of the following risk factors: DM, smoking, HTN, or hyperlipidemia. Consider cardiology consultation or biplane coronary angiography with minimal dye for patients who meet criteria for CTA Cardiac but whose GFR does not allow CTA Cardiac
		x	If all echo, stress, CTA are normal, and patient's functional status is good, no cardiology consult required. Cardiology consult – any selected patients deemed to be at high risk or patients with history of bypass, coronary stents, valve surgery, greater than moderate valvular disease (moderate to severe), abnormal echo, or abnormal stress test. If Coronary stenting is required prior to transplantation • Bare metal stent- Discuss with interventionalist – usually 1 month wait prior to transplant • Drug eluting stent- Discuss with interventionalist – newer stents could potentially wait 3 to 6 months prior to transplant depending on circumstance
Pulmonary	x		ABG on room air
	x		PFT w/ DLCO
		x	ABG on 100% O2 (if bubble echo positive for shunt)
		x	Pulmonary consult - any selected patients with moderately abnormal PFT's, h/o COPD, or deemed to be at high risk

Neurology		x	Carotid Doppler if
			• Smoker age >55 with over 30 pack year history OR
			• Age >60 AND at least one of the following:
			  • CAD
			  • Arterial disease involving aorta or lower extremities
			  • Diabetes mellitus
			  • History of TIA or CVA
			  • Asymptomatic bruit

		x	MRI Brain - Any patient with h/o seizures, CVA, neurological disorders, polycystic liver/kidney disease Neurology consult- Any patient with h/o seizures, CVA, or neurological disorders
GI		X	Colonoscopy (if age 50 and over, or elevated CEA)
	X		Upper endoscopy
		X	ERCP with brushings or FISH (if indicated)
Gynecological (female patients)	X		PAP smears on all females per gynecological recommendations for history/age
		X	Mammography (females age 40 and over)
Consults		X	Anesthesia
	X		Dental
		X	Nutrition Consult
		X	Infectious Disease
		X	Physical Rehabilitation
		X	Interventional Radiology
		X	Oncology

investigations to consider sending with your initial referral

Blood work
Chest X-ray
ECG (Electrocardiogram)
Echocardiogram
Abdominal Ultrasound with dopplers or abdominal CT scan
Gastroscopy/Colonoscopy

Pre-Transplant Optimization

- Reassess medications often
  - Discontinue PPI use if no clear indication
  - Discontinue NSBB or reduce dose when appropriate
    - Systolic BP <90 mmHg or MAP <65
    - HRS or AKI
    - Refractory ascites
    - Hyponatremia (<130)
  - Avoid NSAIDs

Patient Education

CirrhosisCare.ca

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CIRRHOSIS | CAUSES | COMPLICATIONS | SYMPTOMS | PROCEDURES | HEALTHY LIVING | SUPPORTS FOR ALBERTANS

Home → Living with Cirrhosis

Living with Cirrhosis

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Your Role

It's important that you learn everything you can about your disease, so you can do the best job of caring for yourself. Some of the things you can do are:

- Learn about the common complications of cirrhosis so you know what to watch for, especially what symptoms mean you should go to the emergency department. You can find more information here.
- Avoid alcohol. Even if your cirrhosis was not caused by alcohol, everyone with cirrhosis should avoid alcohol.

THANK YOU