

The LTC Patient



DON'T FORGET THE LIVER IN THIS COVID WORLD & BEYOND

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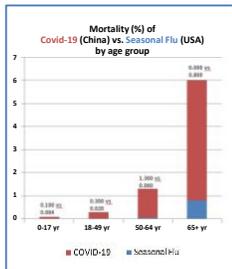
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The LTC Patient

Don't forget the LIVER in this Covid World & Beyond

- In the current pandemic, it is clear that morbidity and mortality of Covid-19 infection disproportionately affect the elderly and those who are immunocompromised and/or have serious comorbidities.¹
- One of the largest at-risk groups is that of the patients with **chronic liver disease**, who commonly require periodic serologic tests, radiologic examinations and surgical biopsy procedures to diagnose and monitor their conditions.¹

1. WHO. Clinical insights for hepatology and liver transplant providers during the COVID-19 pandemic. Retrieved April 1, 2020. <https://www.who.int/publications/item/clinical-insights-for-hepatology-and-liver-transplant-providers-during-the-covid-19-pandemic>



CDC LTC Covid-19 Strategic Recommendations

- ✓ • Keep COVID-19 from entering your facility
 - Identify infections early
 - Prevent spread of COVID-19
 - Assess supply of personal protective equipment (PPE) and initiate measures to optimize current supply
 - Identify and manage severe illness
- ✓ • Limit need for transfers outside LTC
 - Reduce unnecessary staff
- ✓ Improve Overall Health & Focus on the Essentials

1 CDC LTC COVID-19 Strategic Recommendations. <https://www.cdc.gov/ncidod/dlnd/2019-ncov/lp/hcp/strat-recomm.html>



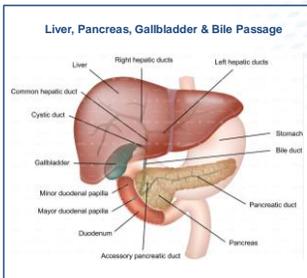
Things to Remember...

Despite being the **largest internal organ**, the liver is often overlooked.

In our new COVID world, where respiratory conditions tend to be much more in the forefront, it is **critical not to forget the liver**.

This is why it is important to revisit the liver in the context of COVID.

Many of these reminders have broad application beyond this COVID period.



Primary Functions of the LIVER

- Bile production and excretion
- Excretion of bilirubin, cholesterol, hormones and drugs
- Metabolism of fats, proteins and carbohydrates
- Enzyme activation
- Storage of glycogen, vitamins and minerals
- Synthesis of plasma proteins, such as albumin, and clotting factors
- Blood detoxification and purification

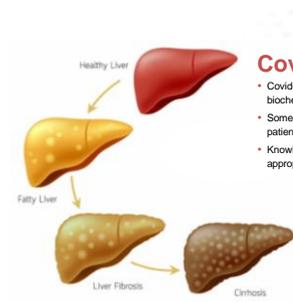


High Risk Patients

The American Association for The Study of Liver Diseases (AASLD) has provided some guidance that highlights the following patients may be among the patients at highest risk for severe illness if infected with COVID-19¹

- >60 years old
- Patients with cirrhosis
- Those with autoimmune hepatitis on immunosuppressive medications
- Pre-transplant and post-transplant patients on immunosuppressive therapy

AASLD Clinical Insights for Hepatology and Liver Transplant providers during the COVID-19 pandemic. Released April 7, 2020. https://www.aasld.org/files/default/user_content/AASLD_COVID19_ClinicalInsights_4.7.2020_Final.pdf



Covid-19 Impact on the Liver

- Covid-19 increases the incidence of elevated serum liver biochemistries (AST, ALT, bilirubin) in the ranges of 14%-53%¹
- Some therapeutic agents used to manage symptomatic COVID-19 patients may be hepatotoxic.¹
- Knowing each patient's baseline liver test results is helpful to assure appropriate treatment.¹

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AASLD Liver Testing Recommendations

- Consider evaluating patients with liver disease for COVID-19 if they develop new onset encephalopathy or other acute decompensation.
- Serologic testing for Hepatitis B and C when assessing patients with COVID-19 and elevated liver biochemistries.
- Regular monitoring of liver biochemistries should be performed in all COVID-19 patients.

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Care Right Where You Are...

- | | |
|---|--|
| 1 | Establish Baseline Liver Status |
| 2 | Utilize Diagnostic and Consultative Services in a most efficient manner (Telemedicine) |
| 3 | Manage Liver Disease and it's Related Conditions Appropriately |

Care to limiting deterioration that would require Hospitalization



Toolkit

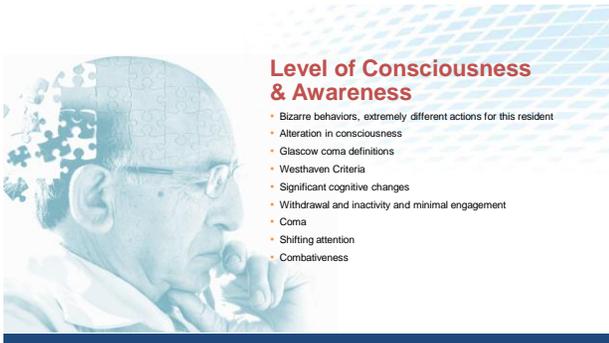
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| | Educate your LTC |
| | Develop a Care Process |
| | Track Your Progress |

Change in Mental Status Hepatic Encephalopathy (HE)

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Causes of Altered Mental Status in Adults

- Fever or infection
- Poisoning or overdose
- Blood sugar/endocrine problems
- Head injury
- Inadequate oxygenation or ventilation
- Conditions leading to decreased blood flow or oxygen to the brain
- Cardiac or diabetic emergencies
- Shock
- Stroke
- Behavioral illness
- Seizures

American Red Cross Emergency Medical Response

Chronic Liver Disease (CLD) affects over 5.5 million patients in the USA^{3,4}, of who more than 600,000 have cirrhosis.⁵

3. Kim 2002
4. Scragg 2015
5. CDC: Novel Coronavirus Pneumonia Emergency Response Epidemiology Team.



HE

HE is most commonly a syndrome observed in patients with **cirrhosis**.

Subtle signs of it are observed in nearly 70% of these patients. Given its extremely high prevalence, HE should be a condition that LTC providers are readily able to diagnosis and treat.⁶

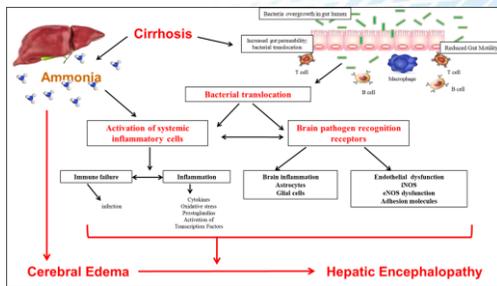
However, due to its episodic nature, slow progression and symptoms which overlap those of other diseases, clinicians often miss this diagnosis.

Top cause of 30-day hospital readmissions⁷

LTC providers need to be both knowledgeable and vigilant regarding its prevalence, pathophysiology, diagnosis and treatment.

6. Elzer 2017
7. Tavenor et al 2016







Diagnosis of hepatic encephalopathy:

- Elevated free serum ammonia level.
- EEG: shows non-specific high amplitude low frequency waves and triphasic waves.
- CT scan and MRI of the brain may be necessary in ruling out intracranial lesions. In acute encephalopathy brain edema may be seen.

Common precipitating factors:

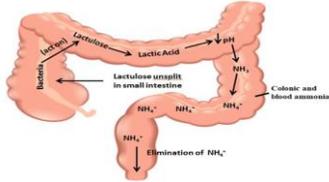
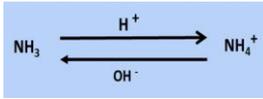
Renal failure, GIT bleeding, infection, constipation, increased dietary protein intake. Opiates, benzodiazepines, anti-depressants and anti-psychotics may also worsen encephalopathy. Hypokalaemia and alkalosis (due to vomiting or excessive use of K-losing diuretics) in crease solubility of NH3 thus increase its passage across the blood brain barrier.

Differential diagnosis of encephalopathy (other causes of coma):

Intracranial lesions (intracranial ha, tumor, abscess), infections (meningitis, encephalitis), metabolic encephalopathy (hypoglycaemia, uremia, electrolyte imbalance), alcoholic encephalopathy, post-seizure encephalopathy.

Mechanism of action of Lactulose

- A non-absorbable disaccharide
- It produces osmosis of water — Diarrhea
- It reduces pH of colonic content & thereby prevents absorption of NH₃
- It converts NH₃-NH₄ that can be excreted





RIFAXIMIN

Rifaximin is a minimally absorbed oral antimicrobial agent that is concentrated in the gastrointestinal tract, has broad-spectrum activity against gm+ and gm- aerobic and anaerobic enteric bacteria, and has a low risk of inducing bacterial resistance.¹¹

In randomized studies, Rifaximin was more effective than non-absorbable disaccharides and had efficacy that was equivalent to or greater than that of other antibiotics used in the treatment of acute HE.¹²

© Delta 2008
© Park 2005

Usual Adult Dose for Hepatic Encephalopathy.



Lactulose 30 mL orally 3 times a day or 300 mL in 700 mL water or normal saline as an enema retained for 30-60 minutes every 4 to 6 hours.
Maintenance dose: 30-45 mL orally 3x a day.



Rifaximin 550 mg orally twice a day



Embolization of portosystemic shunts:

Resistance to rifaximin and lactulose could be evaluated for embolization of portosystemic shunts.

Evidence from retrospective studies suggests that the procedure decreases hospital admissions and improves survival, but adverse effects include gastro-esophageal varices, worsening ascites, and renal dysfunction due to contrast-induced nephropathy.¹³

© Leticia 2017



Nutrition

Cirrhotic patients commonly have malnutrition, muscle wasting (sarcopenia) and reduced survival as a consequence.

Research dating back decades has debunked ideas of reducing protein intake to reduce a nitrogen load and increased ammonia burden as a consequence (see reference below). Indeed, the recommendations now encourage small frequent protein meals throughout the day with a night-time snack of complex carbohydrates. This is often optimized in conjunction with a nutritional support team.

Consensus recommendations of the International Society for Hepatic Encephalopathy and Nitrogen Metabolism recommend optimal daily caloric intake of 35-40 kcal/kg and protein intake of 1.2-1.5 g/kg ideal body weight and provision of night time supplementation.¹⁴

Zinc is occasionally helpful where there is deficiency or confirmed losses.

© Amy 2011



Exercise

As with normal patients, exercise in patients with liver disease can improve functional capacity, lean body mass and risk of falls.¹⁵

Exercise has the potential as an adjunct to improve nutrition, to reduce the frailty of patients that predisposes them to higher ammonia levels and greater risk of falls. However, more studies are needed to clearly identify the parameters for which it can be safe and effective.

One can generally expect long-term care residents with multiple co-morbidities to benefit from exercise, with significant improvements in depression and pain relief as a consequence of endorphin release.¹⁶

© Elizabeth 2015
© Balbir 2016



Branched Chain Amino Acids (BCAA):

A preparation of amino acids (valine, leucine, and isoleucine) normally given orally or by nasogastric tube, have been postulated to alter the balance of amino acids in the brain as well as to provide energy supplementation.

A recent Cochrane review of 16 randomized clinical trials found high quality evidence of clinical benefit but no effect on mortality, quality of life, or nutrition parameters.¹⁷

Thus, for some patients who are intolerant to the recommended protein intake, BCAA supplements may be considered as a means of meeting this nutritional need without risking detrimental effects on the mental state.¹⁸

The guidelines should be consulted here. We don't believe this review article (Marchesini) is overwhelmingly supported by the hepatology community.

17. Quast 2017
18. Marchesini 2000



L-Ornithine-L-aspartate: (LOLA):

A combination containing the amino acids ornithine and aspartic acid given by intravenous infusion.

A meta-analysis of 20 randomized controlled trials showed LOLA to be as effective as non-absorbable disaccharides, with a trend towards superiority, with few adverse effects.¹⁹

19. Zhu 2016



Probiotics:

Probiotics have been found to be effective for HE compared to placebo but not more so than lactulose.²⁰

20. Sudo 2016



Liver Transplantation:

Over HE improves significantly and reverses after liver transplantation, although for some of these patients signs of cognitive impairment persist.^{21,22}

Moreover, the prospect of patients with HE receiving a liver transplant in a timely manner may be hindered by the MELD score (Model for End-Stage Liver Disease), which does not correlate well with this disease entity.²³

²¹ Coopers 2014
²² Gask-Milneuz 2011
²³ Wu 2003

Ongoing Care for HE Patients

Symptom / need	Assessment	Intervention
Systolic hypertension	Blood pressure, signs of headaches	Monitor vital signs QD for patients with liver failure, potential for HE
Increased muscle tonicity (partial or generalized)	Assess increased muscle tone	Monitor for changes in muscle tonicity, difficulty in moving, turning or repositioning.
Myoclonus (fasciculations, posturing)	Assess muscle tightness, extremity positioning changes, fall risk, balance scores	Physical Therapy Restorative nursing plan
Dysoct/jugular eye movements	Monitor eye movements tonicity	Eye tracking charting, convergence, divergence
Fluid and electrolyte imbalance, clotting disorder	Changes in symptoms	Laboratory draw for electrolytes, bilirubin, prothrombin and pre-albumin; family and patient education, dietary consultation, medrxn schedule
Mental status changes	Track behaviors, consciousness, aggression, uncooperative behavior, ability to attend to directions and details, and West Haven Criteria	Plan interventions which reduce distress and allow person-centered EBP care; utilize facility behavior tracking sheets; plan activity interventions; incorporate family into 1:1 intervention as needed.
Mood changes	Mood/scores, Depression evaluation, BIMS, Anxiety score, MMSE, Delirium	Person-centered daily care which accommodates needs of patients and family visits; testing and interventions supportive of EBP, meds per physician / NP orders
ADL changes	Monitor ADL, scores; task segmentation; SBH during care; mobility deficits	Care needs to be individualized
Eating assistance with caloric management	Weights; Assistance with eating	Small, frequent protein meals; monitor changes in food and fluid intake, as needed; labs as above; weights
Family/caregiver updates by ROC team	Monitor for education deficits; Care questions	Team meetings; Rounds with SBAR or IPASS; Regular charting of involvement and updates during condition changes



Palliative Care:

The very effectiveness of treatments for HE and other aspects of chronic liver disease has enabled elderly patients to survive longer with increasingly intensive care, often with substantial discomfort and suffering of the patients and considerable burden on families, caregivers and the healthcare system.²⁴

Despite this, data from the UK reports that referral to palliative care is low and over 2/3 of patients with liver disease die in the hospital after multiple inpatient hospital stays.

The benefits of palliative care are numerous including improved quality of life and prolonged survival.^{25,26}

²⁴ The Lancet 2018
²⁵ Sures 2010
²⁶ Sures 2009



Diagnostic & Therapeutic Roles of the LTC Interdisciplinary Team

Discipline	Diagnostic	Therapeutic
Nursing Team	Monitor physical and cognitive signs and symptoms of HE, and food acceptance	Patient and family education on medications and compliance, disease trajectory, administer medications, provide behavioral, palliative care.
Pharmacist	Evaluate and monitor polypharmacy, drug-drug interactions, pharmaceutical guides and evidence based pharmaceutical guides.	
Primary Care Provider	Obtain clinical history, conduct physical exam, and order psychometric tests (PHES: "gold standard")	Prescribe lactulose and rifaximin; coordinate with other specialists on diagnostics and treatment.
Neurologist	Evaluate electroencephalogram (spectral, versus visual EEG)	Treat and manage neurologic disease; manage patient's pain
Psychologist	Conduct Stroop test, smartphone application	Provide patient counseling.
Psychiatrist	Assess psychiatric symptoms, alcoholic liver disease, and withdrawal	Provide patient counseling, and management of anxiety, depression and pain.
Infectious Disease	Rule out, or treat infectious disease having symptoms similar to HE, or which might precipitate or exacerbate HE	Prescribe appropriate antibiotics
Endocrinologist	Identify severe hyperglycemia and poorly-controlled diabetes	Ensure that patient's glycemic levels are well-controlled.
Nephrologist	Rule out or treat advanced renal disease and uremia	Treat renal disease; advise interdisciplinary team of implications for clearance of ammonia and other toxic substances
Social Worker	Get feedback from patient and family on adherence to therapy. Provide support and person-centered counseling; monitor for cognitive changes	Coordinate with family and other caregivers to help ensure adherence to therapy; provide support system, and adequate housing.
Occupational Therapist	Evaluate safety of home and work environments, skill evaluations, driving, and other life skills and activities affected by HE	Advise patient, caregivers and interdisciplinary team of these risks and interventions to intervene them.
Dietitian	Evaluate adequacy of total caloric and protein intake	Adjust diet to mitigate frailty and sarcopenia



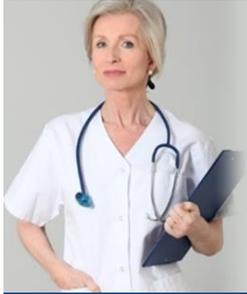
Attending Physician / APN / PA:

Dx:

- Clinical history and physical
- Order psychometric tests (PHES: "gold standard")

Tx:

- Prescribe lactulose and rifaximin
- Coordinate with other specialists on diagnostics and treatment



Director of Nursing & Nursing Staff:

Dx

- Monitor signs and symptoms of cognitive changes, liver flap, HE, MDS assessment for changes, interim assessment, clinically complex resident with exacerbation of symptoms care planning
- Monitor disease trajectory

Tx

- Medication administration with comfort and polypharmacy
- Compliance of medication consumption
- Community health transitions of care support and follow-up
- Patient and Family Education on medications and compliance
- Provide palliative, progressive disease care and education, and end-of-life (EOL) Hospice Care



Consultant Pharmacist:

Dx:

- Polypharmacy monitoring
- Drug-drug interactions
- Evidence-based pharmaceutical guides
- Disease-specific evaluation
- Therapeutic response

Tx:

- Prescribe lactulose and rifaximin
- Coordinate with other specialists on diagnostics and treatment



Nephrologist:

Dx:

- Rule out or treat advanced renal disease and uremia

Tx:

- Treat renal disease
- Advise multidisciplinary team of implications for clearance of ammonia and other toxic substances.



Future therapeutic considerations:

- Polyethylene glycol (PEG) administered through an NG tube for more rapid resolution
- Glycerol phenylbutyrate
- Ornithine phenylacetate (OP)
- Extracorporeal devices such as Molecular Adsorbent Recirculating System (MARS) for removal of ammonia in severe cases
- Fecal Microbiota Transplantation

Key Take Away:

- ① Keep HE (Hepatic Encephalopathy) top of mind as one potential cause for 'Change in Mental Status'
- ② Develop a process for your facility to efficiently and effectively diagnosis and treat HE
- ③ Include all members of the IDT in this process with a CQI process to assure that appropriate outcomes are being met



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LTC HE In-service Toolkit

- | | |
|--|------------------------|
| | Educate Your LTC Staff |
| | Develop a Care Process |
| | Track Your Progress |

Access to the LTC HE In-service Toolkit
 1. Program attendees will receive an email with a link to the tool-kit
 Access this webinar and the tool-kit on the NADONA website at <https://www.nadona.org/tool-kits-and-more/#1592507477205-5476a43b-15a8>



LTC HE In-service Toolkit Contents



- 2 LTC HE In-service decks with facilitator notes for live presentation
- 2 Links to recorded LTC HE in-services with voiceover for on demand use



LTC HE peer reviewed article (PDF)

- Provides in-service facilitator with additional reference material to prepare for LTC HE in-service facilitation
- Can be printed and distributed to in-service attendees as an enduring reference
