Gastroenterology & Hepatology On-Call Aid

This is a guideline designed for medical doctors in CUH to assess and manage acutely unwell Gastroenterology and Hepatology patients.

For all acutely unwell Hepatology patients, please print off and use 'CUH Decompensated Cirrhosis Care Bundle' available here. Please file in patient's medical notes when completed. This is helpful to all members of the medical team, particularly on-call doctors and nursing staff.

Variceal Bleeding

Stabilise with fluid resuscitation/blood products including: RBC, Fibrinogen, Platelets (aim >50x10^9/L), and possibly Octaplas® (Aim for Hb of approximately 7g/dL as over transfusion increases risk of re-bleed due to increased portal pressures).

Dual IV access, group and cross match, inform general surgery and anaesthetics for use of emergency theatre for endoscopy. If necessary activate massive transfusion protocol and involve ICU early.

Start IV Terlipressin: (2mg STAT and then 2mg every 4 to 6 hours, until haemostasis achieved, reduce to 1mg every 4 to 6 hours thereafter with frequent review) if presumed variceal bleeding. Prescribe prophylactic broad-spectrum antibiotics (e.g. Ceftriaxone).

Contraindications to Terlipressin: hypertension, severe Peripheral Arterial Disease, Ischaemic Heart Disease. Acute pulmonary oedema can develop secondary to Terlipressin.

Patients should be fasted for emergency endoscopy (within 12-24 hours) for banding of oesophageal varices and injection of gastric varices with glue.

Note: If massive GI bleed, urea and lactate are typically very high.

If the above measures do not achieve haemostasis, and/or patient is unstable:

1. Contact anaesthetics, surgeons, interventional radiology for assistance.
2. Consider insertion of Sengstaken–Blakemore tube (typically requires endotracheal intubation concomitantly).
3. TIPS or BRTO performed by Interventional Radiology.

Hepatic Encephalopathy (HE)

Assess for causes: GI Bleeding, Sepsis, Dehydration, Electrolyte imbalances, Constipation, AKI, SBP, Volume Depletion (including Large Volume Paracentesis), Portal/Hepatic Vein Thrombosis, Benzodiazepines, Narcotics, Alcohol. Hypoglycaemia is important to monitor as patients with cirrhosis have reduced glycogen storage.

Imaging: CT/MRI of brain to exclude other causes of low GCS; Ultrasound Abdomen with Doppler Portal Vein to assess for cause of decompensation (e.g. portal thrombus, HCC).

Grade I (West Haven) HE can be assessed using Number Connection Test.

In patients with delirium/encephalopathy and liver disease, where it is unclear if HE is the cause (vs alternative), plasma ammonia can be measured. A normal value suggests a non-HE aetiology of delirium/encephalopathy.

EEG is not used routinely.

Management:

- Lactulose PO or via NG (15-30mls TDS) aiming for 2-3 soft bowel motions/day.
- Enemas 1-2/day if necessary.
- Rifaximin: Used in acute setting after above, and as prophylaxis after confirmed episode of HE at 550mg BD.

Ascites

Any patient presenting to A&E with new onset (grade II/III) ascites, worsening ascites, suspected sepsis, and/or any complication of cirrhosis should have a **diagnostic tap performed as soon as possible**. Ultrasonography may be used by those competent/trained to do so.

Ascitic fluid sent for Differential Cell Count (EDTA (FBC) bottle), C&S (Blood culture bottles), Albumin and Amylase (universal container) and Cytology. A high SAAG gradient >11g/L indicates the ascites is due to portal hypertension.

Diuretics: Spironolactone commenced at 100mg/day, once daily dosing (up to a maximum dose of 400mg/day) and Furosemide at 40mg/day (up to a max of 160mg) with daily weights to achieve 0.5kg/day weight loss in patients without oedema, and 1kg/day weight loss in patients with oedema. Monitor U&Es daily.

Diuretics should be discontinued if severe hyponatraemia (serum sodium <125mmol/L), AKI, worsening hepatic encephalopathy, or incapacitating muscle cramps develop.

Request Dietetic input for low salt diet. Note very low salt diet increases diuretic complications.

Book Ultrasound Abdomen with Doppler portal vein.

Therapeutic large volume paracentesis with albumin replacement: (usually performed in patients either resistant to maximal doses of diuretics or intolerant due to side effects, and in patients who become symptomatic or uncomfortable due to ascites).

- Maximum volume to be drained 15L.
- For every 2.5L drained infuse 100mls of 20% albumin
- Albumin is requested on blood requisition form and charted on CUH Blood Component/Product Prescription and Transfusion Record – each unit (100 ml) should be given over 20-30 minutes.

NOTE:

1. No need to clamp drain as long as albumin being replaced.
2. Albumin replacement does not depend on albumin level.
3. Drain usually removed after 6 hour due to risk of secondary bacterial peritonitis.
4. After removal of drain, if still leaking, apply stoma bag to site (for 48 hours usually) – will stop spontaneously. Sutures may occasionally be required thereafter to prevent infection.
5. In patients with ascites who are hypotensive and/or hypovolaemic hyponatraemic – use 5% albumin as fluid replacement of choice. Normal saline/Hartmann's, when used as fluid replacement may worsen ascites.

AKI and Hepatorenal Syndrome (HRS)

HRS is a diagnosis of exclusion, diagnosed on the basis of a serum Creatinine (sCr) > 133 µmol/l which is not reduced with the administration of albumin (1g/kg of body weight), after a minimum of 2 days off diuretics, along with the absence of current or recent treatment with potentially nephrotoxic drugs, and the absence of shock. Most AKI in Cirrhosis is not HRS.
HRS is manifested by oliguria and Urinary Sodium <10 mmol/L.

- Type 1: sCr doubles in <2 weeks
- Type 2: sCr doubles over longer period

Management of AKI:

- Strict input and output monitoring, typically need to catheterise patient.
- 68% of AKI in Cirrhosis is pre-renal, thus diuretics should be withheld.
- Discontinuation of all nephrotoxic and relevant drugs, such as Vasodilators, NSAIDs, Beta-blockers, as well as ARBs/ACE inhibitors.
- Investigate for alternative causes of AKI, including arranging renal ultrasound if appropriate.
- IV administration of albumin (**1g of albumin per kg** of body weight (max dose 100g) daily, for two consecutive days)
- If AKI failing to improve with above measures, treat as HRS: Terlipressin at low dose initally 0.5–1 mg every 4–6 hr IV (or as a continuous iv infusion at 2mg/day initially), with an increase

up to 2 mg every 4–6 hr (max 12mg/day) until sCr decreases below 133 µmol/L. Treatment should be maintained until a complete response (sCr below 133 µmol/L) or for a maximum of 14 days either in partial or non-response. Patients should have an ECG prior to Terlipressin administration. Contraindications including Ischaemic Heart Disease should be considered. Albumin is used as an adjunct to Terlipressin at a typical dose of 20–40 g/day.

- Renal-replacement therapy may need to be considered in patients who do not have a response to vasoconstrictor drugs. Involve and seek advice from Renal team early.

Hyponatraemia in Portal Hypertension/Cirrhosis

It is generally considered that hyponatremia should be treated if <125 mmol/L:

- Hypovolaemic hyponatremia requires plasma volume expansion with crystalloid (if ascites see above) and the correction of the causative factor. Diuretics should be withheld.
- The management of hypervolemic hyponatremia requires attainment of a negative water balance.

Use of hypertonic saline should be restricted to severely symptomatic hyponatremia (e.g. seizures, coma, and cardio-respiratory disturbance).

Serum sodium concentration should not increase more than 8-10 mmol/L per day. Serum sodium should be monitored closely, and a strict fluid balance maintained.

Spontaneous bacterial peritonitis

Symptoms are often vague, hence very early diagnostic paracentesis is essential.
Diagnose if paracentesis demonstrates Neutrophils >250 cells/mm^3.
Usual causative agents are gram negative bacteria (e.g. E.coli), and gram positive cocci (streptococci/enterococci).
Treat with broad spectrum antibiotics (typically Ceftriaxone or Piperacillin-Tazobactam) & Albumin: **1.5g albumin/kg** (max 100g Albumin) **in the initial six hours,** followed by **1g/kg on day 3.**

Patients recovering from one episode of SBP: secondary prophylaxis may be considered: typically Norfloxacin (Ciprofloxacin used as alternative), Co-Trimoxazole, or in certain instances, Rifaximin.

Thromboprophylaxis in Liver patients

Patients with chronic liver disease are at a high risk of thromboembolism even with a prolonged prothrombin time. Prescribe prophylactic LMWH if at risk of VTE and no active bleeding as per hospital policy.

In patients with thrombocytopenia and elevated INR, if platelets >50x10^9/L and INR <2.5, LMWH prophylaxis may be considered after discussion with Consultant or Registrar.

Vitamin K (5-10mg IV for 1 to 3 days) is typically only administered if patients are suspected to be bleeding. It is primarily effective in cholestatic liver disease, and those with Vitamin K deficient states (such as in alcoholism).

VTE prophylaxis should be omitted the day prior to invasive procedures e.g.: ERCP, Liver biopsy, TIPS Recommence 24 hours after procedure if there is no sign of post-procedure bleeding.

Alcoholic Hepatitis

Typically evident with raised INR, and AST/ALT ratio >2.

Treat with Steroids if Maddrey DF Score >32 and if there is no evidence of sepsis, GI bleeding, or pancreatitis. Cease if these occur. Prednisolone 40mg/day for max of 28 days, reduce dose once LFTs start improving.

Management of Alcohol-Dependent patients when admitted

IV Pabrinex (I+II) for prophylaxis/treatment of WE (Wernicke's Encephalopathy):

- Prophylaxis of WE associated with alcohol withdrawal: 1 pair daily for 1-3 days then switch to oral thiamine
- Treatment of suspected or established WE x 1-2 pairs TDS for minimum of 5 days then oral thiamine.

Chlordiazepoxide or Diazepam regularly for initial 3-4 days of admission given risk of Delirium Tremens and alcohol withdrawal seizure.
Psychiatry Liaison nurse review – ICM referral.
Dietician review.
AUDIT-C for Alcohol Use.

Alcohol Quantification in units for each patient being admitted:

https://www.drugs.ie/alcohol_info/tips_tools/how_much_am_i_drinking2/

The low-risk weekly alcohol guidelines for adults are:

- Women: Less than 11 standard drinks (110g pure alcohol) spread out over the week, with at least two alcohol-free days.
- Men: Less than 17 standard drinks (170g pure alcohol) spread out over the week, with at least two alcohol-free days.

Paracetamol Overdose/Fulminant Liver Failure

Typically an on-call presentation from A&E, but may occur on wards and/or occultly in malnourished/elderly patients.

Triad of **jaundice/encephalopathy/coagulopathy** occurring acutely.

Very high INR/PT, ALT/AST and Bilirubin.

Paracetamol levels may be undetectable if taken late and/or late presentation.

If in doubt about reliability of history or diagnosis or timing, administer N-Acetylcysteine (NAC) anyway (can be discontinued and rarely causes side-effects).

SNAP Protocol for NAC:

- Bag 1: 100 mg/Kg in 200 ml (0.9% NaCl or 5% Dextrose) over 2 hours
- Bag 2: 200 mg/Kg in 1000 ml (0.9% NaCl or 5% Dextrose) over 10 hours

- Check bloods (Paracetamol level, LFTs, INR, U&E, FBC) 2 hours prior to end of 2nd infusion
- NAC treatment can be stopped after 12 hours if
    - INR ≤1.3
    - ALT <100 U/L and not more than doubled from admission
    - Paracetamol concentration <20 mg/L.
- If all 3 criteria are not reached: NAC is to be continued at 200 mg/kg over a further 10 hours.

King's College Criteria (for liver transplant): pH <7.3, INR>6.5, Creatinine>300mmol/l, Grade III/IV Encephalopathy.

If patient acidotic, encephalopathic, INR >3, ALT>1000, Bilirubin high, renal impairment, specialist advice is required.

Liaise with St Vincent's Hepatology unit. ICU team should be made aware of patient.

If this appears to be a serious paracetamol overdose with fulminant liver failure, it is important to get psychiatry input as early as possible and obtain collateral history as this may impact on transplant decision.

Monitor all bloods, more than once daily, in particular – **glucose, pH, lactate, INR**.
Severe complication: Cerebral oedema.

Other drugs

Any drug can potentially cause liver issues and often it's a combination.

May need to be take drug history several times (always check it yourself), they may not consider an antibiotic taken months ago or an Over-the-Counter preparation relevant, particularly slimming pills, and anabolic steroids. Keep checking drug history and look for collateral if picture fits.

'Sick' inpatients often have some LFT elevation, this may relate to sepsis or drugs, however, the drugs may be important for their condition (e.g. sepsis), so again specialist help should be sought and the pros and cons of stopping medications discussed and reviewed depending on progress

Drug induced Liver injury may present as Hepatocellular Injury (AST/ALT high) or Cholestatic Liver injury (ALP/γGT/Bilirubin elevation) or a mixed picture with both elements. Calculation of the R Factor for Liver Injury can discriminate between hepatocellular and cholestatic.

Important blood tests for immunosuppressed patients

These are mainly transplant patients or patients on biologics.

Septic screen, CMV IgM and EBV IgM, +/- Parvovirus IgM.
Also send bloods for trough levels of Immunosuppressants (Tacrolimus, Cyclosporin).
Common Immunosuppressants used: Tacrolimus (can cause AKI if supratherapeutic), Mycophenolate Mofetil, Cyclosporin (can also cause renal impairment).

Liver Screen bloods

Infectious: Hepatitis A, B, C and E; EBV, CMV; HIV, Syphilis.

Autoantibodies including coeliac serology and immunoglobulins.

Iron studies and ferritin, caeruloplasmin in young patients and α1-antitrypsin (very rare cause of liver pathology). Only check αFP in known cirrhotics. Note: αFP is not a 'good tumour marker' (non-specific, often elevated in viral hepatitis and pregnancy).

Scoring Systems in Gastroenterology/Hepatology

Child Pugh Classification:

Measure	1 point	2 points	3 points
Total bilirubin, µmol/l (mg/dl)	<34 (</=2)	34-50 (2-3)	>50 (>3)
Serum albumin, g/l	>35	28-35	<28
Blood coagulation: PT: seconds prolonged INR	 1-3 <1.7	 4-6 1.71-2.30	 > 6 > 2.30
Ascites	None	Slight, or controlled medically	Moderate or severe
Encephalopathy	None	Grade 1-2	Grade 3-4

Child Pugh A – Score 5-6
Child Pugh B – Score 7-9
Child Pugh C – Score 10-15

MELD-Na score (Model For End-Stage Liver Disease) – calculate online
Maddrey DF/Glasgow Hepatitis Score

Glasgow Blatchford Score for upper GI Bleed:

Admission risk marker	Score value
Blood urea (mmol/L)	
6.5–8	2
8–10	3
10–25	4
>25	6
Hb (g/L) for men	
120–130	1
100–120	3
<100	6
Hb (g/L) for women	
100–120	1
<100	6
Systolic blood pressure (mmHg)	
100–109	1
90–99	2
<90	3
Pulse ≥100/minute	1
History/co-morbidities	
Presentation with melaena	1
Presentation with syncope	2
Hepatic disease*	2
Cardiac failure†	2

*Known history of or clinical/laboratory evidence of chronic or acute liver disease
†Known history of or clinical/echocardiographic evidence of cardiac failure

A score of 0 **indicates low risk** and potential suitability for outpatient management or deferment of endoscopic treatment. A score of **6 or more is associated with a >50% risk of needing an intervention**.
This should not be applied to suspected variceal haemorrhage.

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This guideline was updated by the department of Gastroenterology/Hepatology, 2025, based on prior guidelines developed in CUH.

Authors:
C. Hurley[1], O. Crosbie[1], M. Hughes[2], M Kinnane[2], F. Toor[1], C. Kiat[1].

1. Department of Gastroenterology and Hepatology, Cork University Hospital
2. Pharmacy Department, Cork University Hospital

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