## STANDARD TREATMENT WORKFLOW (STW)

# Liver Failure

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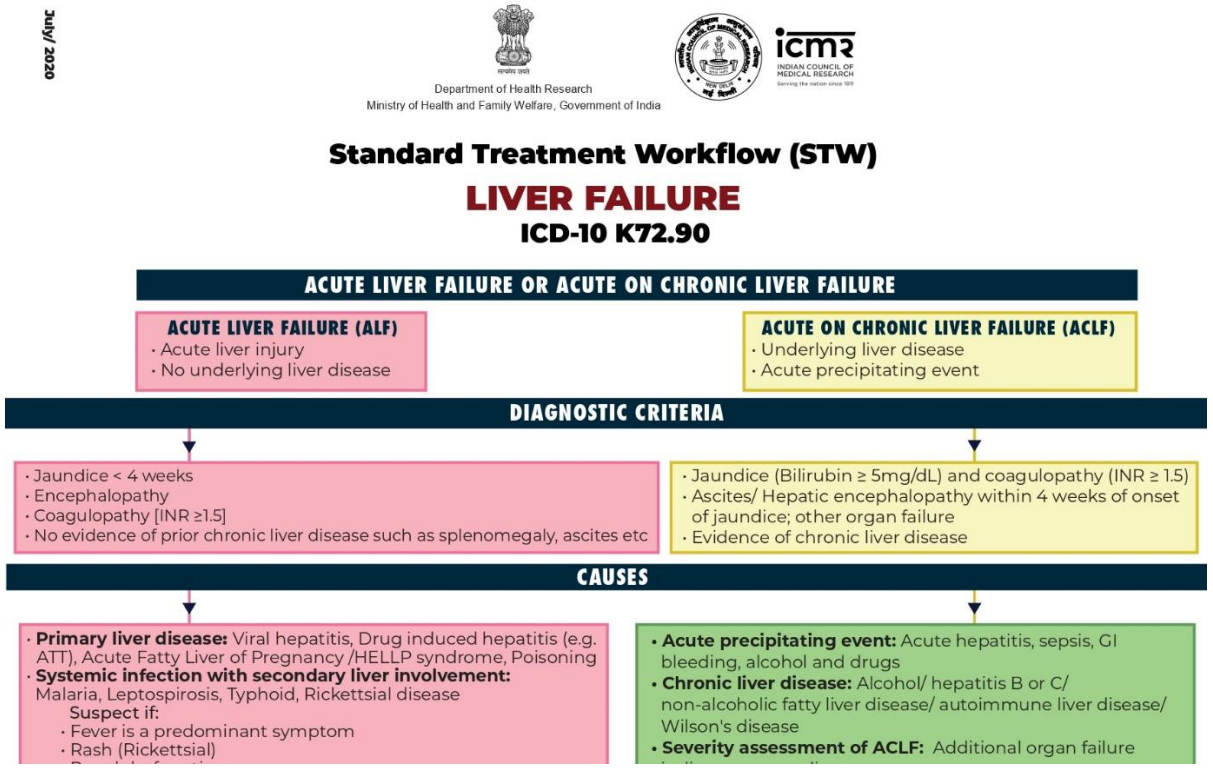

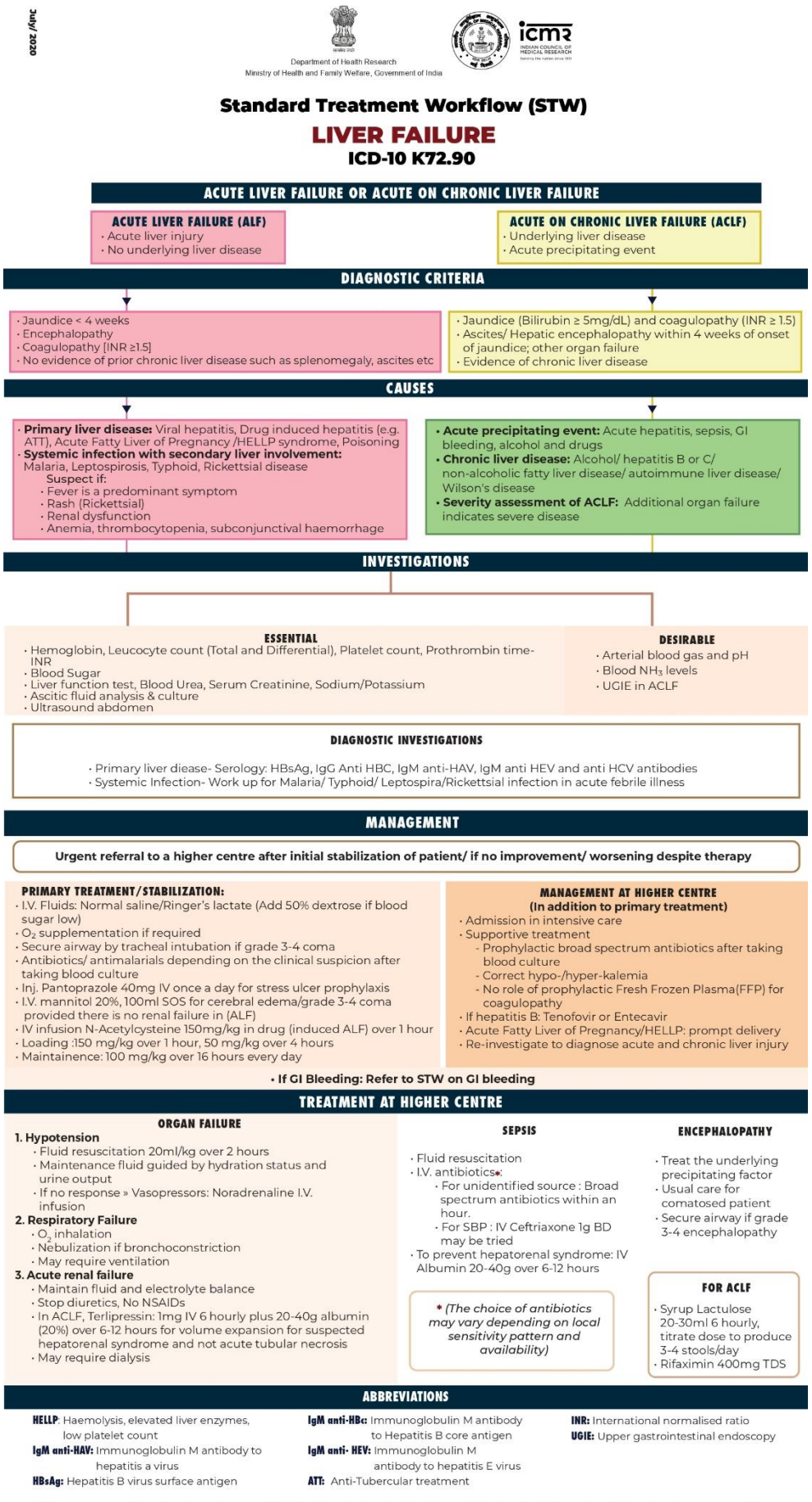
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Standard Treatment Workflow (STW)
LIVER FAILURE
ICD-10 K72.90
ACUTE LIVER FAILURE OR ACUTE ON CHRONIC LIVER FAILURE
ACUTE LIVER FAILURE (ALF)
· Acute liver injury
· No underlying liver disease
ACUTE ON CHRONIC LIVER FAILURE (ACLF)
· Underlying liver disease
· Acute precipitating event
DIAGNOSTIC CRITERIA
· Jaundice < 4 weeks
· Encephalopathy
· Coagulopathy [INR ≥1.5]
· No evidence of prior chronic liver disease such as splenomegaly, ascites etc
· Jaundice (Bilirubin ≥ 5mg/dL) and coagulopathy (INR ≥ 1.5)
· Ascites/ Hepatic encephalopathy within 4 weeks of onset of jaundice; other organ failure
· Evidence of chronic liver disease
CAUSES
· Primary liver disease: Viral hepatitis, Drug induced hepatitis (e.g. ATT), Acute Fatty Liver of Pregnancy /HELLP syndrome, Poisoning
· Systemic infection with secondary liver involvement: Malaria, Leptospirosis, Typhoid, Rickettsial disease
Suspect if:
· Fever is a predominant symptom
· Rash (Rickettsial)
· Renal dysfunction
· Anemia, thrombocytopenia, subconjunctival haemorrhage
· Acute precipitating event: Acute hepatitis, sepsis, GI bleeding, alcohol and drugs
· Chronic liver disease: Alcohol/ hepatitis B or C/ non-alcoholic fatty liver disease/ autoimmune liver disease/ Wilson's disease
· Severity assessment of ACLF: Additional organ failure indicates severe disease
INVESTIGATIONS
ESSENTIAL
· Hemoglobin, Leucocyte count (Total and Differential), Platelet count, Prothrombin time-INR
· Blood Sugar
· Liver function test, Blood Urea, Serum Creatinine, Sodium/Potassium
· Ascitic fluid analysis & culture
· Ultrasound abdomen
DESIRABLE
· Arterial blood gas and pH
· Blood $NH_3$ levels
· UGIE in ACLF
DIAGNOSTIC INVESTIGATIONS
· Primary liver diease- Serology: HBsAg, IgG Anti HBC, IgM anti-HAV, IgM anti HEV and anti HCV antibodies
· Systemic Infection- Work up for Malaria/ Typhoid/ Leptospira/Rickettsial infection in acute febrile illness
MANAGEMENT
Urgent referral to a higher centre after initial stabilization of patient/ if no improvement/ worsening despite therapy
PRIMARY TREATMENT/STABILIZATION:
· I.V. Fluids: Normal saline/Ringer's lactate (Add 50% dextrose if blood sugar low)
· $O_2$ supplementation if required
· Secure airway by tracheal intubation if grade 3-4 coma
· Antibiotics/ antimalarials depending on the clinical suspicion after taking blood culture
· Inj. Pantoprazole 40mg IV once a day for stress ulcer prophylaxis
· I.V. mannitol 20%, 100ml SOS for cerebral edema/grade 3-4 coma provided there is no renal failure in (ALF)
· IV infusion N-Acetylcysteine 150mg/kg in drug (induced ALF) over 1 hour
· Loading :150 mg/kg over 1 hour, 50 mg/kg over 4 hours
· Maintainence: 100 mg/kg over 16 hours every day
MANAGEMENT AT HIGHER CENTRE
(In addition to primary treatment)
· Admission in intensive care
· Supportive treatment
- Prophylactic broad spectrum antibiotics after taking blood culture
- Correct hypo-/hyper-kalemia
- No role of prophylactic Fresh Frozen Plasma(FFP) for coagulopathy
· If hepatitis B: Tenofovir or Entecavir
· Acute Fatty Liver of Pregnancy/HELLP: prompt delivery
· Re-investigate to diagnose acute and chronic liver injury
· If GI Bleeding: Refer to STW on GI bleeding
TREATMENT AT HIGHER CENTRE
ORGAN FAILURE
1. Hypotension
· Fluid resuscitation 20ml/kg over 2 hours
· Maintenance fluid guided by hydration status and urine output
· If no response » Vasopressors: Noradrenaline I.V. infusion
2. Respiratory Failure
· $O_2$ inhalation
· Nebulization if bronchoconstriction
· May require ventilation
3. Acute renal failure
· Maintain fluid and electrolyte balance
· Stop diuretics, No NSAIDs
· In ACLF, Terlipressin: 1mg IV 6 hourly plus 20-40g albumin (20%) over 6-12 hours for volume expansion for suspected hepatorenal syndrome and not acute tubular necrosis
· May require dialysis
SEPSIS
· Fluid resuscitation
· I.V. antibiotics*:
· For unidentified source : Broad spectrum antibiotics within an hour.
· For SBP : IV Ceftriaxone 1g BD may be tried
· To prevent hepatorenal syndrome: IV Albumin 20-40g over 6-12 hours
* (The choice of antibiotics may vary depending on local sensitivity pattern and availability)
ENCEPHALOPATHY
· Treat the underlying precipitating factor
· Usual care for comatosed patient
· Secure airway if grade 3-4 encephalopathy
FOR ACLF
· Syrup Lactulose 20-30ml 6 hourly, titrate dose to produce 3-4 stools/day
· Rifaximin 400mg TDS
ABBREVIATIONS
HELLP: Haemolysis, elevated liver enzymes, low platelet count
IgM anti-HAV: Immunoglobulin M antibody to hepatitis a virus
HBsAg: Hepatitis B virus surface antigen
IgM anti-HBc: Immunoglobulin M antibody to Hepatitis B core antigen
IgM anti- HEV: Immunoglobulin M antibody to hepatitis E virus
ATT: Anti-Tubercular treatment
INR: International normalised ratio
UGIE: Upper gastrointestinal endoscopy
This STW has been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit the website of DHR for more information: (stw.icmr.org.in) for more information.
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