

Standard Operating Procedure (SOP)

Approach to Transaminase Elevation (AST/ALT)

Special region (1)

Union of Myanmar

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Approved by Internal Medicine Unit

1. PURPOSE

To provide a standardized, evidence-based approach for classification of transaminase elevation severity and diagnostic evaluation.

2. DEFINITIONS

Transaminitis = elevation of AST/ALT indicating hepatocellular injury. ALT is more liver-specific.

3. INITIAL PRINCIPLE

Always confirm abnormal result by repeating test before full evaluation.

4. CLASSIFICATION OF SEVERITY

- Mild: $<5 \times$ ULN
- Moderate: $5-15 \times$ ULN
- Severe: $>15 \times$ ULN
- Massive: $>10,000$ IU/L

5. Causes of transaminase elevation

Mild elevation	Moderate	Marked	Massive
Chronic viral hepatitis	all causes in mild elevation	Drug toxicity (especially Paracetamol)	paracetamol overdose
Hepatitis B	Acute viral hepatitis: ○ Hepatitis A ○ Hepatitis B ○ Hepatitis C ○ Hepatitis E	Ischemic hepatitis ("shock liver")	Ischemic hepatitis
Hepatitis C			Fulminant viral hepatitis
NAFLD (metabolic syndrome)			
Alcohol-related liver disease			
Drug-induced liver injury (DILI)			
Hemochromatosis			
Autoimmune hepatitis			
Wilson's disease (<55 years)			
Alpha-1 antitrypsin deficiency			

6. LABORATORY/IMAGING workup

Initial Workup

- Ultrasound
- AST, ALT, ALP, bilirubin
- PT/INR (severity marker)
- Viral serology (HAV, HBV, HCV, HEV)

Second line investigation (if available and suspected)

- Iron studies (hemochromatosis)
- Autoimmune markers (ANA, ASMA)
- Ceruloplasmin (young patients)
- Alpha 1 anti-trypsin level

7. CLINICAL INTERPRETATION

AST>ALT: alcohol

ALT>AST: viral/NAFLD

>1000: ischemia/toxin/viral

R Ratio Formula (R)

$$R = \frac{ALT/ULN_{ALT}}{ALP/ULN_{ALP}}$$

R value	Pattern	Meaning
>5	Hepatocellular	"Hepatitis pattern"
2-5	Mixed	Both injury types
<2	Cholestatic	"Obstructive pattern"

8. Management of Transaminitis by Etiology

Condition	Management Summary
Chronic Viral Hepatitis (HBV, HCV)	Antivirals (Tenofovir, DAAs), monitor ALT & viral load, HCC screening
Acute Viral Hepatitis (HAV, HEV)	Supportive care, hydration, monitor INR & bilirubin
Drug-Induced Liver Injury	Stop drug, N-acetyl cysteine if paracetamol, monitor INR
Ischemic Hepatitis	Treat shock, fluids/vasopressors, supportive
NAFLD	Weight loss, control diabetes/lipids
Alcohol-related Liver Disease	Alcohol cessation, nutrition, steroids if severe
Autoimmune Hepatitis	Steroids ± azathioprine
Hemochromatosis	Phlebotomy, monitor ferritin
Wilson's Disease	Chelation (penicillamine), zinc
Alpha 1 anti-trypsin deficiency	Supportive, transplant if severe
Fulminant Hepatitis	ICU care, transplant referral

9.COMPLICATIONS

Acute complications– Acute liver failure, Hypoglycemia

Long term complications- Cirrhosis and Hepatocellular carcinoma

10. REFERENCES

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2. Pratt DS, Kaplan MM. Evaluation of abnormal liver enzymes. *N Engl J Med*. 2000;342:1266–71.
3. Jameson JL, Fauci AS, Kasper DL, et al. *Harrison's Principles of Internal Medicine*. 21st ed. McGraw-Hill; 2022.