

## Possible causes of an elevated Serum Gamma Glutamyl Transferase (GGT)

(GGT > 100 U/L)

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**ALT < 80 U/L; ALP < 200 U/L**

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**Liver enzyme induction**

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**Alcohol excess**

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**Drugs**

Benzodiazepines

Phenytoin

Tricyclics

Warfarin

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**Obesity**

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**Diabetes mellitus**

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**Steatosis, NASH (Non-Alcohol Steatohepatitis)**

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**Hypertriglyceridaemia**

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**'Normal' for subject**

(some subjects have 'normal' GGT values of up to 120 U/L)

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**ALT < 80 U/L; ALP > 200 U/L**

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**Cholestatic liver disease**

Extrahepatic obstruction

Intrahepatic obstruction

Drug/Alcohol toxicity<sup>1</sup>

Space-occupying lesion<sup>2</sup>

Cirrhosis

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**Two disorders, for example:**

Liver enzyme induction plus bone disease

Phenytoin (induces liver GGT production, and also stimulates bone ALP directly)

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**ALT > 80 U/L; ALP < 200 U/L**

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**Hepatocellular disease**

Steatohepatitis (NASH)

Drug/Alcohol toxicity<sup>1</sup>

Hepatitis (A, B, C)

EBV infection

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**ALT > 80 U/L; ALP > 200 U/L**

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**Mixed Hepatocellular and Cholestatic disease**

Acute hepatitis

Chronic active hepatitis

Space-occupying lesion<sup>2</sup>

Cirrhosis

Drug/Alcohol toxicity<sup>1</sup>

1. In alcoholic liver disease, the AST is often greater than ALT.

2. Space-occupying lesions: malignancy, abscess, cyst, etc.