

Liver Enzyme Tests - Part II

A previous publication of *Rx for Success* (#3) discussed the liver enzyme tests and our general underwriting approach. This issue will go into more detail as to the causes of elevation of the liver enzymes. In brief review, the major liver enzymes that are checked in an insurance profile include SGOT (also known as AST), SGPT (also known as ALT), and GGTP. The SGPT/ALT is the most specific enzyme being produced primarily by the liver. The SGOT/AST is produced by liver tissue but also by the heart, kidney, muscle, brain, pancreas, and lung. The GGTP is produced by the liver, kidney, pancreas, heart, and brain.

Excessive alcohol consumption is a common cause of elevated liver enzymes in the United States. It is estimated that 13.5% of all Americans will suffer from an alcohol abuse disorder in their lifetime. Fatty liver is the initial manifestation of alcoholic liver disease. In women, as little as 2 ounces of alcohol a day can cause fatty liver. If a person develops fatty liver and continues to drink, in 90% of the cases, the liver disease will progress to alcoholic hepatitis. Both fatty liver and alcoholic hepatitis are completely reversible if all drinking is stopped. Only 10-20% of chronic alcoholics develop irreversible or end-stage liver disease known as cirrhosis.

Another significant cause of elevated liver enzymes is drug-induced hepatitis. In these cases, it is the medication that a person is taking that is inflaming the liver. There are many common medications that can cause increased liver enzymes including:

- *Acetaminophen*
- *Antibiotics (Penicillins, Augmentin, Erythromycin)*
- *Anesthetic agents*
- *Cholesterol lowering (Niacin, Mevacor)*
- *Anti-seizure (Dilantin, Valproic acid, Tegretol)*
- *Hormones (estrogens, androgens)*
- *Oral hypoglycemic agents used for diabetes*
- *Psychiatric (Phenothiazines, Haldol, Thorazine, Valium, barbituates)*
- *Pain medication (Darvon)*
- *Isoniazid*

The above listing is not intended to be complete but these are the more common causes of drug-induced hepatitis. In general these medications will affect the SGOT/AST and SGPT/ALT more than they would the GGTP; however, the GGTP can be elevated by barbituates, tranquilizers, dilantin, digoxin, and cholesterol-lowering drugs such as Mevacor. If the liver enzymes are elevated due to a medication, discontinuation of that medication will lead to normal or near normal values within weeks to a few months.

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Viral hepatitis is another significant cause of elevated liver enzymes (See *Rx for Success* #18 Hepatitis A,B,C). Hepatitis A generally does not progress to chronic liver disease. In Hepatitis B, up to 10% of patients will develop chronic liver disease. In Hepatitis C, the majority of cases go on to develop chronic liver disease. There are other viruses such as Cytomegalovirus (CMV) and Epstein Barr Virus (EBV) which can also elevate liver enzymes.

A couple of other conditions, which commonly will elevate liver enzymes, are biliary obstruction due to gallstone disease and fatty liver (often due to alcohol, obesity, diabetes, or high lipids).

Incidentally, the condition of the blood specimen could affect the liver enzymes. Severe lipemia causes an elevation in the SGOT/AST and the SGPT/ALT; it does not affect the GGTP. A hemolyzed blood specimen will increase all three liver enzymes. A non-fasting state does not affect any of the liver enzymes. These conditions are indicated by the laboratory on transmission of results and are taken into consideration by the underwriters.

In summary, when faced with the situation of elevated liver enzymes, some follow-up investigation might help clarify the picture.

- *Was the applicant taking a medication that was not initially mentioned?*
- *Was there a documented viral illness in the days to weeks prior to the blood draw?*
- *Was the condition of the specimen normal?*
- *Has the client been evaluated by their own physician for chronic liver enzyme elevations?*

To get an idea of how a client with abnormal liver enzymes would be viewed in the underwriting process, feel free to use the attached *Ask "Rx" pert underwriter* for an informal quote.

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751 Broad Street, Newark, NJ 07102-3777
RX9.DOC IFS-A005225, Ed. 07/02 Exp. 01/04

Liver Enzymes - Ask "Rx" pert underwriter
(ask our experts)

Producer _____ Phone _____ FAX _____
Client _____ Age/DOB _____ Sex _____

If your client has elevated liver enzymes, please answer the following:

- ① How long has this elevation been present? _____ (years)
- ② Please give the date and results of the most recent liver enzyme tests.
- a) AST/SGOT _____
b) ALT/SGPT _____
c) GGTP _____
- ③ Have these results been
- increasing fluctuating up and down
 decreasing unknown
 stable
- ④ Does your client drink alcohol? (answer all that apply)
- yes, please note amount and frequency _____
 no
 drinking pattern changed recently _____
- ⑤ Is your client on any medications (prescription and/or non-prescription)?
- yes, please give details _____
 no
- ⑥ Please check if your client has had any further studies for evaluation:
- a) Hepatitis A, B, or C normal abnormal
b) iron studies normal abnormal
c) liver ultrasound or CT scan normal abnormal
d) liver biopsy normal abnormal
e) no further evaluations
- ⑦ Does your client have any other major health problems (ex: heart disease, etc)?
- yes, please give details _____
 no

After reading the *Rx for Success* on Liver Enzymes - Part II, please feel free to use this Ask "Rx" pert underwriter for an informal quote.

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