



## Complete Summary

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### GUIDELINE TITLE

American Gastroenterological Association medical position statement: evaluation of liver chemistry tests.

### BIBLIOGRAPHIC SOURCE(S)

American Gastroenterological Association medical position statement: evaluation of liver chemistry tests. Gastroenterology 2002 Oct;123(4):1364-6. [1 reference]  
[PubMed](#)

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## SCOPE

### DISEASE/CONDITION(S)

Abnormal serum liver chemistry test values

### GUIDELINE CATEGORY

Diagnosis  
Evaluation  
Risk Assessment

### CLINICAL SPECIALTY

Family Practice  
Gastroenterology  
Internal Medicine

### INTENDED USERS

Physicians

## GUIDELINE OBJECTIVE(S)

To present guidelines that will assist the gastroenterologist and primary care physician in a rational approach to the interpretation and further diagnostic evaluation of patients with abnormal liver chemistry tests

## TARGET POPULATION

Patients with abnormal serum liver chemistry tests

## INTERVENTIONS AND PRACTICES CONSIDERED

### Evaluation of Abnormal Liver Chemistry Tests

1. Initial evaluation of abnormal liver tests: a detailed history, inventory of medications (including vitamins, herbs, over-the-counter drugs, etc.), physical examination, assessment of the patient's risk factors for liver disease, medications, alcohol consumption, comorbid conditions, and signs and symptoms of hepatic disease
2. Algorithmic approach to evaluation, as appropriate
3. Evaluations based on specific clinical scenarios of individual patients, including confirmation of abnormalities, if error is suspected, with laboratory testing (liver chemistries; prothrombin time [PT]; albumin; complete blood count [CBC] with platelets; hepatitis A, B and C serologies; iron [Fe]; total iron-binding capacity [TIBC]; ferritin)
  - Evaluation of patients with alanine aminotransferase (ALT) and aspartate aminotransferase (AST) elevations: noninvasive serologic tests; observation, if appropriate, with close clinical follow-up and serial serum liver chemistry testing; if appropriate, additional serologic and radiologic evaluations and potentially a liver biopsy
  - Evaluation of patients with evidence of hyperbilirubinemia and cholestasis when serum bilirubin and alkaline phosphatase elevations are in excess of the aminotransferase elevations: determination if hyperbilirubinemia is conjugated (direct) or unconjugated (indirect); additional evaluations as indicated

## MAJOR OUTCOMES CONSIDERED

- Liver biochemistries in both asymptomatic and symptomatic patients
- Diagnostic and prognostic value of liver function tests
- Financial costs of selective tests

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

An initial MEDLINE literature search under the subject headings Liver, Chemistry, Function, and Test revealed over 14,000 references, with over 6000 references published since 1990. Thus, it was essential to adopt a selective approach to the literature, analyzing data investigating specific liver biochemistries in both asymptomatic and symptomatic patients. Data from abstracts were not routinely used, and when they were used, it was explicitly stated that the data were published solely in abstract form. Finally, although no arbitrary dates of publication were used for studies included for analysis in the technical review document, medical advances over the past two decades (identification of hepatitis C virus, genetic testing methodologies, etc.) may make older studies obsolete. Emphasis was placed on a critical analysis of more recent literature and any limitations in cited studies resulting from subsequent advances in medical diagnosis and treatment were explicitly stated.

#### NUMBER OF SOURCE DOCUMENTS

Not stated

#### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Subjective Review

#### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

#### METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

#### DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

#### METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

#### RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

#### COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

#### METHOD OF GUIDELINE VALIDATION

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The American Gastroenterological Association (AGA) Clinical Practice Committee approved this guideline on March 3, 2002. The American Gastroenterological Association Governing Board approved it on May 19, 2002.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

#### Interpretation of Abnormal Liver Chemistry Tests

The range of normal laboratory values for serum biochemical tests is defined as the mean of the distribution  $\pm 2$  standard deviations of a presumably representative healthy population. By definition, 2.5% of healthy individuals will therefore have an abnormal elevation of a given liver chemistry test and, in fact, a normal value does not completely exclude the presence of hepatic disease. The interpretation of all abnormal liver chemistries must be taken in the clinical context of a given patient. The initial evaluation of abnormal liver tests includes a detailed history, inventory of medications (including vitamins, herbs, over-the-counter drugs, etc.), and a physical examination. This should include an assessment of the patient's risk factors for liver disease, medications, alcohol consumption, comorbid conditions, and signs and symptoms of hepatic disease. When findings from these indicate that one or more diagnostic considerations are likely, subsequent evaluation should be directed toward establishing these diagnoses, rather than following an algorithm. The algorithm approach is useful mainly when there are no clinical clues or when the suspected diagnosis cannot be verified. An abnormality of a specific serum liver chemistry test must be interpreted in the context of all clinical information and a decision about the need for further diagnostic evaluation and/or the appropriate evaluation patient can best be made based on the specific clinical scenario of the individual patient.

The evaluation of patients with alanine aminotransferase (ALT) and aspartate aminotransferase (AST) elevations is described in Figure 1 of the original guideline document. In patients with elevated serum aminotransferases, common hepatic diseases should be excluded with noninvasive serologic tests. If these tests are unremarkable, a decision regarding additional serologic testing versus observation should be based on the clinical scenario. If one elects observation, close clinical follow-up and serial serum liver chemistry testing is essential. If markedly elevated and/or persistent alanine aminotransferase and aspartate aminotransferase levels are noted, or if significant symptoms or evidence of chronic or decompensated liver disease are present, a more expeditious and complete initial diagnostic evaluation typically is warranted. Similarly, chronic alanine aminotransferase or aspartate aminotransferase elevations (6 or more months) usually warrant additional serologic and radiologic evaluations and potentially a liver biopsy. Hyperbilirubinemia due to either hepatocellular, cholestatic, or metabolic diseases may occur, but persistent hyperbilirubinemia due to any of these etiologies likely warrants a more expeditious diagnostic evaluation.

Figures 2 and 3 of the original guideline document describe guidelines for evaluating patients with evidence of hyperbilirubinemia and cholestasis when serum bilirubin and alkaline phosphatase elevations are in excess of the aminotransferase elevations.

Initial evaluations should determine whether the hyperbilirubinemia is conjugated (direct) or unconjugated (indirect). In asymptomatic adult patients with an isolated, mild unconjugated hyperbilirubinemia, the patient should be evaluated for Gilbert's syndrome, hemolysis, and medication-induced hyperbilirubinemia. If conjugated hyperbilirubinemia is present, the presence of concomitant alkaline phosphatase elevations must be assessed and biliary obstruction should be excluded.

These guidelines serve to provide a rational approach for the interpretation and evaluation of abnormal serum liver chemistries. In asymptomatic or minimally symptomatic patients with mild laboratory abnormalities, unremarkable physical examinations, and intact hepatic function, a reasonable approach may include an initial evaluation for common hepatic diseases, with close clinical follow-up if the initial studies are unrevealing. However, in patients with significant symptoms, evidence of chronic or decompensated liver disease, or severe liver chemistry abnormalities, a complete and expeditious evaluation is essential.

#### CLINICAL ALGORITHM(S)

The original guideline contains the following clinical algorithms:

- Evaluation of patients with alanine aminotransferase (ALT) and aspartate aminotransferase (AST) elevations
- Evaluation of patients with evidence of hyperbilirubinemia and cholestasis when serum bilirubin and alkaline phosphatase elevations are in excess of the aminotransferase elevations

### EVIDENCE SUPPORTING THE RECOMMENDATIONS

#### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation. The guideline is accompanied by a comprehensive literature review. In the data analysis used for that review, there were no type 1 data (well-designed randomized controlled trials) and few type 2 data (well-designed cohort [prospective or retrospective] studies with concurrent or historical controls) directly addressing the evaluation of liver chemistry tests.

### BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

#### POTENTIAL BENEFITS

- Appropriate interpretation and evaluation of serum liver chemistries may result in useful prognostic and diagnostic information, high-quality and cost-effective health care

- Prompt diagnosis and therapy of many common liver diseases can prevent progression to end-stage liver disease

#### POTENTIAL HARMS

- False-positive test results
- Complications of liver biopsy

### QUALIFYING STATEMENTS

#### QUALIFYING STATEMENTS

In the data analysis used for the technical review, it should be stated that there are no type 1 data (well-designed randomized controlled trials) and few type 2 data (well-designed cohort [prospective or retrospective] studies with concurrent or historical controls) directly addressing the evaluation of liver chemistry tests.

### IMPLEMENTATION OF THE GUIDELINE

#### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

### INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

#### IOM CARE NEED

Getting Better  
Living with Illness

#### IOM DOMAIN

Effectiveness

### IDENTIFYING INFORMATION AND AVAILABILITY

#### BIBLIOGRAPHIC SOURCE(S)

American Gastroenterological Association medical position statement: evaluation of liver chemistry tests. Gastroenterology 2002 Oct;123(4):1364-6. [1 reference]  
[PubMed](#)

#### ADAPTATION

Not applicable: The guideline was not adapted from another source.

#### DATE RELEASED

2002 Oct

GUIDELINE DEVELOPER(S)

American Gastroenterological Association - Medical Specialty Society

SOURCE(S) OF FUNDING

American Gastroenterological Association

GUIDELINE COMMITTEE

American Gastroenterological Association Clinical Practice Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Not stated

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

According to the guideline developer, the Clinical Practice Committee meets three times a year to review all American Gastroenterological Association guidelines. This review includes new literature searches of electronic databases followed by expert committee review of new evidence that has emerged since the original publication date.

GUIDELINE AVAILABILITY

Electronic copies: Available from the [American Gastroenterological Association \(AGA\) Gastroenterology journal Web site](#).

Print copies: Available from the American Gastroenterological Association, 4930 Del Ray Avenue, Bethesda, MD 20814.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- R. M. Green, S. Flamm. AGA technical review on the evaluation of liver chemistry tests. *Gastroenterology* 2002 Oct; 123(4): 1367-84.

Electronic copies: Available from the [American Gastroenterological Association \(AGA\) Gastroenterology journal Web site](#).

Print copies: Available from the American Gastroenterological Association, 4930  
Del Ray Avenue, Bethesda, MD 20814.

#### PATIENT RESOURCES

None available

#### NGC STATUS

This summary was completed by ECRI on January 14, 2003. It was verified by the  
guideline developer on February 27, 2003.

#### COPYRIGHT STATEMENT

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The logo for FIRSTGOV, featuring the word "FIRST" in blue and "GOV" in red, with a small red star above the "I" in "FIRST".

