



September 1997

# C60-A

## Blood Alcohol Testing in the Clinical Laboratory; Approved Guideline



This guideline provides technical and administrative guidance on laboratory procedures related to blood alcohol testing, including specimen collection, methods of analysis, quality assurance, and reporting of results.

A guideline for global application developed through the Clinical and Laboratory Standards Institute consensus process.

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## Blood Alcohol Testing in the Clinical Laboratory; Approved Guideline

### Abstract

C60-A, *Blood Alcohol Testing in the Clinical Laboratory; Approved Guideline*, is designed to aid the clinical laboratory in producing timely and accurate blood alcohol results. Its key objective is to address, as comprehensively as possible, recommendations to assure the integrity of the laboratory report on blood alcohol. The document conforms to the objective by addressing specimen collection, methods of analysis, quality assurance, and reporting and significance of results as separate sections. Statutory provisions are included as additional resource information.

The subcommittee recognizes the possible medicolegal impact of blood alcohol testing. The section devoted to the chain-of-custody strives to define the laboratory's responsibility regarding the specimen by outlining specific procedures for the handling and storage of the specimen and subsequent documentation.

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## Blood Alcohol Testing in the Clinical Laboratory; Approved Guideline

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## Foreword

This guideline, *Blood Alcohol Testing in the Clinical Laboratory; Approved Guideline*, was developed in response to the frequently expressed need for a readily available information source which addresses the increasingly more frequent involvement of the hospital or independent clinical laboratory in collecting and analyzing blood (and other biological specimens) for ethyl alcohol. The presence of alcohol is frequently associated with trauma, and with a great variety of acute illnesses and chronic diseases. Further, alcohol presence often adversely affects both morbidity and mortality. Therefore, appropriate trauma care and diagnosis and treatment of many medical syndromes and diseases in adults require information about the patient's alcohol status. Demand for blood alcohol testing of patients can, therefore, be expected to continue to increase.

Years of experience have borne out the expectation that the absence, or presence and concentration of alcohol in blood will often have later medicolegal or forensic implications and significance, in addition to its immediate clinical relevance. Some simple and practical measures taken at the outset can greatly reduce the impact of such subsequent legal developments on the clinical laboratory and its personnel. This guideline addresses that issue and the resultant responsibilities of clinical laboratories which are not limited to, but include the collection of blood specimens, quality assurance, records, and reports.

The Subcommittee on Blood Alcohol Testing has endeavored to produce a brief but adequate set of criteria to assist clinical laboratories in meeting the demand for timely and reliable blood alcohol testing for clinical purposes, while minimizing the impact of later medicolegal developments on the laboratory.

## Universal Precautions

Because it is often impossible to know which might be infectious, all patient blood specimens are to be treated with "universal precautions." Guidelines for specimen handling are available from the U.S. Centers for Disease Control and Prevention. NCCLS document M29, *Protection of Laboratory Workers from Infectious Disease Transmitted by Blood, Body Fluids, and Tissue*, deals specifically with all aspects of this issue.

## Key Words

Alcohol, blood alcohol, analysis, blood alcohol concentration, chain-of-custody, intoxication.

## Blood Alcohol Testing in the Clinical Laboratory; Approved Guideline

### 1 Scope and Requirements

#### 1.1 Scope of the Problem

The cost of alcohol abuse in our society is extraordinarily high in terms of the loss of human life, its detrimental contribution to the causes of illness and injury, productivity losses in the workplace, and the stress these in turn put on our medical resources and our judicial system. In a series of special workshops on alcoholism and alcohol abuse, the American Society of Clinical Pathologists Task Force on Drug Abuse and Toxicology<sup>1</sup> recognized the magnitude of the problem of alcohol in our society. The title of these seminars was "Alcohol - The Second Great Imitator" because of the medical challenges in the diagnosis of this problem.

#### 1.2 Medical Requirements

Alcohol abuse should be considered one of the most important contributory causes of injury and disease today. The diagnosis of alcohol-use disorders, such as alcohol dependence and alcohol abuse, is a clinical procedure and subject to the problem of inexactness.<sup>2</sup> Diagnosis of the disease may be based not only on the features of alcoholism, with all its signs and symptoms, but on an accurate determination of blood alcohol concentration at the time of examination of a patient.

The use of alcohol acutely affects the central nervous system. Many of the signs and symptoms manifested by the patient are related to the degree of intoxication, as reflected by the concentration of alcohol in the patient's blood. Since many patients with traumatic injuries who are admitted to the emergency department are noncomatose, patient history or initial interview becomes most important. Patients showing direct effects of alcohol—breath odor, released inhibitions, alcoholic facies, toxic amblyopia, possible tachycardia and cardiac arrhythmias, nystagmus, and traumatic injuries of varying degrees—warrant further studies. These studies should include a complete physical examination, clinical laboratory analyses, and determination of the blood or serum alcohol concentration. Other drugs of misuse or abuse should also be considered in the testing procedures. The information in Dubowski's table on the Stages of

Acute Alcoholic Influence/Intoxication<sup>3</sup> (Appendix A) and the Guide to Serum-Alcohol Test Results (Appendix B) become important in the evaluation of the patient, for they define possible correlations of blood alcohol concentration with its clinical signs and symptoms.

Because alcoholism can masquerade as many other diseases, vital signs become very important during the physical examination, and the possibility of closed head injury or neurological disorder should be considered. Associated disease diagnoses include neurological disorders; alcohol-induced or nonalcohol-associated cardiovascular disorders; arrhythmias, tachycardias, electrocardiographic alterations; liver disease; fatty liver, alcoholic hepatitis, portal fibrosis, cirrhosis and possible liver carcinoma; blood and blood clotting disorders: anemia, prothrombin elevations and thrombocytopenia; alcoholic pancreatitis; infections; alcoholic myopathies; digestive tract disorders: ulcers, gastritis, esophagitis, esophageal varices and cancer; endocrine disorders; skeletal system disorders: ischemic necrosis of the femoral heads and fractures; skin disorders; and toxic psychoses.

Indicated laboratory studies include analysis for blood alcohol concentration and other relevant clinical laboratory tests.

The evaluation of the *comatose patient* may be more difficult due to the lack of patient history. The physical examination and results of laboratory studies often reveal the diagnosis. These should be combined with radiological studies, particularly of the skull and chest. A proper evaluation of these studies will be valuable for decisions regarding admission to the hospital, proper treatment, and to minimize possible medical and legal complications.

This document necessarily emphasizes certain legal and other nonclinical aspects of blood alcohol testing. It is, therefore, important to recognize at all times that the clinical laboratory's first and primary responsibility is to the patient and to the physician.