

EXHIBIT “1”

MEDICAL TOXICOLOGY

DIAGNOSIS AND TREATMENT OF HUMAN POISONING

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TABLE 33-11
**STAGES OF ACUTE ALCOHOLIC INFLUENCE/
 INTOXICATION IN NONTOLERANT INDIVIDUALS**

BLOOD ALCOHOL CONCENTRATION (% w/v)	STAGE OF ALCOHOL INFLUENCE	CLINICAL SIGN/SYMPTOM
0.01–0.05	Sobriety	No apparent influence Behavior nearly normal by ordinary observation Slight changes detectable by special tests
0.03–0.12	Euphoria	Mild euphoria, sociability, talkativeness Increased self-confidence; decreased inhibitions Diminution of attention, judgment, and control Loss of efficiency in finer performance tests
0.09–0.25	Excitement	Emotional instability; decreased inhibitions Loss of critical judgment Impairment of memory and comprehension Decreased sensory response; increased reaction time Some muscular incoordination
0.18–0.30	Confusion	Disorientation, mental confusion; dizziness Exaggerated emotional states (fear, anger, grief, etc.) Disturbance of sensation (diplopia, etc.) and of perception of color, form, motion, dimensions Decreased pain sense Impaired balance; muscular incoordination; staggering gait, slurred speech
0.27–0.40	Stupor	Apathy; general inertia, approaching paralysis Markedly decreased response to stimuli Marked muscular incoordination; inability to stand or walk Vomiting; incontinence of urine and feces Impaired consciousness; sleep or stupor
0.35–0.50	Coma	Complete unconsciousness; coma; anesthesia Depressed or abolished reflexes Subnormal temperature Incontinence of urine and feces Embarrassment of circulation and respiration Possible death
0.45 +	Death	Death from respiratory paralysis

Adapted from Dubowski KM: Alcohol determination in the clinical laboratory. *Am J Clin Pathol* 1980;74:749. Used with permission.

The plasma/whole blood ethanol ratio is approximately 1/1.18. If the blood specimen was centrifuged and the cellular elements removed, then the resultant reading for the plasma or serum must be reduced by 16%–18% to convert the value to a blood ethanol level. Proper collection technique involves the use of nonalcohol skin antiseptics, although at least one study found no significant difference between alcohol and nonalcohol preps in measurement of the blood ethanol level.⁶⁸ Another study also showed that performing the venipuncture through a pool of 100% ethanol on the skin did not affect ethanol results as determined with the DuPont automatic clinical analyzer.⁶⁹

Postmortem Blood Alcohol Specimens

Blood ethanol produced by postmortem decomposition rarely exceeds 50 mg/dL.⁷⁰ Fluoride ion, mercuric ion, and cold storage inhibit the tissue formation of ethanol by microorganisms. Femoral and jugular veins are the best postmortem blood sampling sites. Intracardiac samples may demonstrate falsely elevated ethanol levels compared with femoral blood samples.⁷¹ Because of diffusion of ethanol from the stomach, pleural or pericardial samples may contain ethanol levels up to 190 mg/dL higher than those of corresponding femoral blood samples.⁷²

Within 24 hours of death, little ethanol is formed even at room temperature. No blood specimen from bodies refrigerated within 4 hours of death and stored up to 28 hours contained more than 10 mg ethanol per deciliter.⁷³ The use of vitreous humor for postmortem ethanol analysis helps distinguish endogenous from exogenous ethanol sources, because bacterial infiltration occurs late in the putrefaction process.⁷⁴

Preservation of Blood Samples

Mechanisms of ethanol decomposition in stored samples include diffusion from improperly sealed containers, ethanol metabolism by microorganisms (inhibited by sodium fluoride), and a temperature-dependent ethanol oxidation reaction. This enzymatic process varies from zero under frozen conditions to 0.29 mg/dL/d at 22°C and 43 mg/dL/d at 62°C.⁷⁵ Temperature, fluoride concentration, and length of storage are the most important variables in ethanol loss during storage, but very little ethanol deteriorates when the sample is stored over a month at 4°C.^{76,77} The presence of bacterial flora and enzymes released from traumatized organs also can affect ethanol decomposition under adverse storage conditions.

Breath Samples

Portable ethanol breath detection devices were developed as rapid, simple, and noninvasive methods that analyze arterial ethanol levels based on the blood/breath ratio of 2,100. This ratio varies between individuals and within one person over time.⁷⁸ Variables altering accuracy include recent use of alcohol or alcohol-containing products (within 15–30 minutes), recent belching or vomiting, inadequate end expiratory specimen (i.e., poor cooperation), presence of obstructive pulmonary disease, and poor technique. Variability in the blood/breath ratio indicates that breath ethanol concentra-