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A Brief Note on Forensic Toxicology

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Commentary

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ABSTRACT

Forensics as well as other fields such as chemical analysis, pharmacology, and clinical chemistry is used in toxicity testing to aid medical and legal investigations of death, poisoning, and drug use. The major interest in forensic toxicology is the acquisition and interpretation of results, not the legal conclusion of the toxicological research or the technology utilized. A toxicology analysis can be conducted on a variety of samples. Any evidence collected at a crime scene that may narrow the search, such as pill bottles, powders, trace residue, and any available chemicals, must be considered by a forensic toxicologist. With this information and samples to work with, the forensic toxicologist must ascertain which toxic substances are present, at what amounts, and what effect those chemicals are expected to see on the person.

INTRODUCTION

There are three basic types of forensic toxicology: post-mortem toxicology, human performance toxicology, and forensic drug testing. The study of biological materials acquired from an autopsy to determine the effects of drugs, alcohol, and toxins is known as post-mortem toxicology. Blood, urine, gastric contents, oral secretions, hair, tissues, and a range of many other biomolecules can all be studied. To ascertain the cause and manner of death, forensic toxicologists collaborate with scientists, medical examiners, and coroners. A dose-response relationship between a

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drug(s) present in the body and its effects on the body is studied in human performance toxicology. This branch of forensic toxicology is in charge of developing and enforcing the rules such as those banning driving while under the influence of alcohol or drugs. Finally, Forensic Drug Testing (FDT) requires the recognition of drug use in the workplace, as well as sports doping, drug-related probation.

Since it is rare for a chemical to remain in its original form once within the body, determining the substance ingested is frequently confounded by the body's natural activities (see ADME). For example, heroin is rapidly metabolized into another substance and then into morphine, necessitating a thorough examination of characteristics such as injection marks and chemical purity to validate a diagnosis. While a pill or other authorized dose of medicine may have grams or milligrams of the active ingredient, an individual sample under inquiry may only contain micrograms or nanograms.

Forensic toxicology has a variety of applications, including:

- Operating under the influence of alcohol or drugs is suspected.
- In both human and animal sports, performance-enhancing medications are used.
- Testing for drugs of abuse
- Drug testing in the workplace
- Cases of suspected drug intoxication or overdose
- Suspected poisoning or drug-related fatality, as well as drug-facilitated assault, rape, or other crime (post-mortem toxicology).

Toxicology is the study of how chemicals and medications affect people and animals. Forensic, clinical, occupational (industrial), environmental, and emergency toxicology are all areas of this large discipline. In forensic and coroner investigations of poisoning, drug use, and death, as well as suspected cases of doping, inhalant or drug misuse, and driving under the influence of alcohol or drugs, forensic toxicology is involved with the medico-legal aspects of toxicology. Toxic substances, drugs (prescription and illicit), alcohol, volatile substances, and industrial, home, or environmental compounds that harm the human body are removed and chemically identified in this forensic science.

Organic materials, such as blood, urine, gastric aspirate, various biological fluids and tissues, and exhibitions, are analyzed qualitatively and quantitatively using gas and liquid chromatographic techniques, as well as mass spectrometry. The toxicology report details the toxic chemicals present in an individual, as well as whether drug concentrations are in line with therapeutic dosage or at a level that causes injury or impairs human performance physically or mentally.