Introduction

Today, through television, most Americans have been exposed to the application of forensic science to the justice system. This programs have made the public aware of important role that forensic science plays in criminal justice system, and enrollment in criminal justice and forensic course in college and high school has increased markedly within the last 10 years. In selecting a jury panel, lawyers are aware that these tv-programs may influence the jurors (called the CSI-effect).

Forensic science:

- The application of sciences to legal issues
- Pharmacology
  - The study of all effects of chemicals on living organisms
- Toxicology
  - The study of toxic or adverse effects of chemicals

Pharmacologist

- is a scientist who, in addition to being trained in the principles of pharmacology, studies other disciplines, including:
  - Physiology,
  - Biochemistry,
  - Chemistry
  - Molecular biology,
  - Statistics
  - Pathology, and usually
  - usually possesses a PhD degree

Toxicologist

- is usually someone with a PhD degree, use the same principles of science as the pharmacologist but generally studies only toxic or adverse effect of chemical,

What is forensic pharmacology and how does it differ from forensic toxicology

- Both disciplines attempt to answer the question of whether a chemical was causally related to an individual’s behavior, illness, injury, or death
- Understanding:
  - Chemical’s pharmacodynamics: the mechanisms that bring about physiological and pathological changes,
  - Pharmacokinetics: how the chemical is absorbed, distributed, metabolized, and excreted, are important in establishing a causal relationship.
- For example: once concentration of chemical and its metabolites in blood and/or urine are determined, it might be possible to determine when the drug was administered or taken.
Introduction: Forensic scientist at work

- A pharmacologist:
  - Expert witness
  - Interpretation of chemical data obtained from analysis of bodily fluids and tissues by a pharmacologist may help attorneys determine the role of a drug in an individual’s behavior or death.
- Forensic toxicologists are generally employed by federal, state, and local government crime laboratories, which may be affiliated with the medical examiner’s office from which they receive fluids and tissues for analysis.
  - May also be involved in drug testing in the workplace or in sports.

Introduction: Real-Life Cases

- Two defendants were accused of raping a woman they had invited to their apartment.
- They claimed that the victim drank herself into a stupor within about 30 minutes after arrival, that she imagined the rape occurred, and that she left her own about four hours later.
  - The victim testified that she had two beers and one scotch within 2.5-hours period. Shortly after she returned and finished her drink, she felt dizzy and lost consciousness. She awoke briefly to find herself being raped but was weak, in a dreamlike state, and could not speak or move.

Chapter 2: Pharmacokinetics and Pharmacodynamics

- Pharmacokinetics:
  - Distribution of chemicals
  - Metabolism of chemicals
  - Excretion of chemicals
- Pharmacodynamics:
  - Cell receptors
  - Neuronal signaling

Chapter 3: Drug Analysis

- Analytical tests
- Chromatography
- Determining blood alcohol concentration

Chapter 4: Drug Abuse and Teenager Statistics

- Drug use and abuse in adolescents
- Forensic issues
Chapter 5: Cannabinoids
- Origins of compounds
- Pharmacology of marijuana
- Forensic issue

Chapter 6: Central Nervous System Stimulants
- Cocaine
- Amphetamine and related drugs
- Pharmacology of CNS stimulants
- Forensic issue

Chapter 7: Central Nervous System Depressants
- The history of depressants
- Pharmacology of CNS depressant
  - Alcohol
  - Barbiturates
  - Benzodiazepines
  - Gamma-hydroxybutyrate
  - Other CNS Depressants
- Forensic issue

Chapter 8: Opioids
- History and origins of opioids
- Pharmacology of Opioids
- Forensic issues

Chapter 9: Hallucinogens
- The history and subgroups of hallucinogens
- Pharmacology of hallucinogens
  - LSD (lysergic acid diethylamide)
  - MDMA
- Forensic issue

Chapter 10: Dissociative Anesthetics
- The definition
- Pharmacology of phencyclidine (PCP) & Ketamine
- Forensic issue
Chapter 11: Inhalants

- The history and definition
- Pharmacology of inhalants
- Forensic issue

Chapter 12: Anabolic-Androgenic Steroids

- The history and definition
- Pharmacology of steroid
- Forensic issue

Chapter 13: The Future of forensic Pharmacology

Chapter 14: Solve the Cases