

13. Specimen Collection For Forensic Toxicology, Workplace Testing, Sports Medicine

A. Overview

1. Alcohol, tobacco and illicit drug use declining but still used.
 - a. Alcohol most common, referred to as “gateway drug”.
 - b. Drugs and alcohol may contribute to high death rate of 15-24 year olds.
 - c. Drug abuse threatens health of baby during pregnancy
 - d. Increased use of drug testing for detecting drugs of abuse and crime scene evidence.
2. Collectors of samples must perform duties with integrity
 - a. Identify donor and samples
 - b. Prevent adulteration or sample substitution
 - c. Properly prepare tamper proof container
 - d. Initiate chain of custody
 - e. Accurately and comprehensively document each step in the process.

B. Forensic Toxicology

1. **Toxicology** - scientific study of poisons including how they are detected, actions on human body, and treatment.
2. **Forensic specimens** are those used in civil or criminal cases.
3. Sample collection requires extensive training, experience and supervision
 - a. Diverse samples - rape kits to items found at crime scene
 - b. Samples may be exposed to outside elements-weather, environment
 - c. Trace samples-single hair, minute drops of blood
 - d. Perform job in variety of environments and provide unquestionably accurate results.
5. In toxicological analysis looking for very small amounts of analyte in blood, urine or other specimens, such as hair.
 - a. Special equipment used so results will not be affected by extraneous materials.
 - b. Specific collection guidelines must be strictly adhered to.
6. May be involved in collecting and analyzing:
 - a. Trace evidence
 - b. Firearms and tool marks
 - c. Toxicology
 - d. Arson and fire debris
 - e. Serological testing of biological evidence
 - f. Documents
 - g. Computers
7. DNA analysis extremely useful
 - a. Same in all parts of body except egg/sperm
 - b. Unchanged through out life
 - c. Present in all cells
 - d. Different in every individual except identical twins.

8. **Chain of custody** (defined) “process for maintaining control and accountability of each specimen from the point of collection to final disposition of the specimen.”
 - a. Must document identity of every individual handling the sample.
 - b. **Chain of custody form** is required.
 - c. Specimen must be placed in permanently sealed, tamper-evident container.
 - d. Every individual who handles every aliquot must sign form.

C. Federal Work Place Drug Testing

1. Department of Health and Human Services (HHS) established scientific and published technical guidelines for federal drug testing programs.
2. HHS also created standards for certifying laboratories performing drug testing for federal agencies such as Department of Transportation (DOT).
3. Each certified lab is inspected twice a year.
4. Collector’s must ensure integrity of sample and strictly adhere to collection process for sample to be considered valid evidence.

D. Sports Medicine and Private Industry

1. Private industries select labs which comply with federal standards.
2. Drug testing in the workplace done for a variety of reasons:
 - a. Contractors or vendors
 - b. Designated positions
 - c. Required for pilots and bus drivers
 - d. Safety or security reasons
 - e. For cause
 - f. After accidents
 - g. Promotions for specific positions
 - h. Reasonable suspicion
 - i. Clearance to return to work.
3. Workplace drug testing common in sports associations.
 - a. Screening done without prior notice.
 - b. Looking for illicit drugs or drugs which may affect performance
4. Procedures must be strict and well defined.
5. Confirmatory testing may be done by more than one lab.

E. Specimen Collection Sites

1. May be permanent, temporary or remote.
2. Minimum requirements:
 - a. Privacy
 - b. Source of water
 - c. Work area for collector
 - d. Collector must restrict access during collection
3. Security measures should include:
 - a. Restricted access to authorized personnel
 - b. Only collection supplies take into collection area
 - c. Unobserved exits and entrances

- d. Secure handling/storage of samples
- e. Access to water must be controlled in collection area
- f. Bluing or color-appropriate agents may be added to toilet

F. Specimen Collection Procedures

1. Collecting urine for drug testing.
 - a. Urine sample of choice
 - 1) drugs present in higher concentration
 - 2) large volumes easy to collect
 - 3) no pain or discomfort-non-invasive collection process
 - b. Select site, have appropriate supplies available
 - c. Urine collection guidelines for drug testing are extensive and highly regulated.
 - d. Must provide appropriate documentation have meticulous attention to details of the procedure or sample may be rejected.
 - e. If information is omitted hold sample for 5 days and submit *Memorandum for Record* to document appropriate corrections
2. Collecting samples for alcohol levels
 - a. Person must give implied informed consent for blood alcohol.
 - b. If sample collected by venipuncture, do not use alcohol to cleanse.
 - c. Correct ID, precautions, and labeling very critical
3. Neonatal Drug Testing
 - a. Drugs may affect fetus in a variety of ways-low birth weight, premature birth, impaired neurological functioning.
 - b. Drug addicted mothers more likely to abuse or neglect child.
 - c. Exposure determined based on mother's history, newborn symptoms, and results of drug testing on mother and infant.
 - d. Variety of drugs implicated, cocaine most often identified.
 - e. Best to collect within 24 hours of birth.
 - f. Meconium may be used, easier to collect than urine and positive result indicates exposure during neonatal months.
4. Tampering
 - a. Variety of substances can interfere with testing: water, liquid soap, bleach, salet , ammonia, vinegar and commercial substances such as UrinAid and Klear.
 - b. HCW must be aware of methods to detect and deter adulteration:
 - 1) unusual color or odor
 - 2) unusually high or low specific gravity, low urine creatinine or electrolytes, positive nitrite with no bacteria.
 - c. In HCW suspects tampering or substitution must follow procedures for second sample collection.
 - d. Second sample collection may be "direct observation" and requires specific criteria to be met before instituting.