INTRODUCTION

Health care professionals in clinical and non-clinical settings often collect blood samples from subjects for forensic analysis, upon request by enforcement officers, or when managing those individuals involved in motor vehicle accidents even when there is no law enforcement officer present. Medical professionals collecting the specimens must observe the time frame restrictions for the collection of blood, ensure that the subject is not a minor, obtain prior consent, observe the procedure for the collection of the blood sample, and secure the blood sample. Proper collection, handling, and storage of the blood specimens are essential in medical-legal cases involving the use of drugs or alcohol. Unexpected and confusing results can lead to an erroneous interpretation in courts of law.

Forensic laboratory technicians and other health care professionals must be aware of the requirements and capabilities of forensic laboratories as there is no point collecting specimens that cannot be tested. Those methods used to draw, prepare, track, and test legal blood specimens differ from those used for medical blood. Always collect physical evidence and forensic blood specimens according to jurisdictional policy. A law enforcement authority must always request the legal venipuncture and observe the procedure.

All specimens must be collected in a medically approved manner. Always wash hands thoroughly before beginning any phlebotomy procedure and after the procedure has been completed. Confirm the identity of the client and explain the procedure. Wear clean, unused gloves at all times.

OBJECTIVES

Upon completion of this course, student will be able to:

- Define terms associated with collection of forensic specimens
- Understand the purpose of forensic blood specimen collection
- Understand the considerations affecting specimen collection
- Identify and implement Chain of Custody procedures
- Perform proper procedures for forensic blood specimen collection
- Identify and illustrate knowledge of proper labeling, handling and storage of specimens
DEFINITION OF TERMS

Alcohol: The unique chemical compound, ethyl alcohol, commonly found in consumable beverages. It is also the chemical class of compounds to be avoided as skin antiseptics.

Blood Alcohol Kit (BAC Kit): A sealed kit containing the equipment and documentation necessary for the collection of a blood sample for forensic purposes.

Breath Alcohol Analysis: Means analysis of a sample of a person's expired breath, using a breath testing instrument designed for this purpose, in order to determine the concentration of ethyl alcohol in the person's breath.

Chain of Custody: Refers to the chronological documentation, and/or paper trail showing the seizure, custody, control, transfer, analysis, and disposition of evidence, physical, biological or electronic. Because evidence can be used in court to convict persons of crimes, it must be handled in a scrupulously careful manner to avoid later allegations of tampering or misconduct which can compromise the case of the prosecution toward acquittal or to overturning a guilty verdict upon appeal.

Contamination: The undesirable transfer of material to physical evidence from another source.

Documentation: Written notes, audio/videotapes, printed forms, sketches, and/or photographs that form a detailed record of the scene, evidence recovered, and actions taken during the search of the crime scene, including chain of custody information.

Drug Screen: A preliminary chemical test that indicates a class of drugs present in a sample.

Evidence: Something that can help identify the responsible persons, establish an element of crime, reconstruct crime events or link crimes.

Forensic Alcohol Analysis: The practical application of specialized devices, instruments and methods by trained laboratory personnel to measure the concentration of Ethyl Alcohol in samples of breath, blood, and urine of persons involved in traffic accidents and violations.

Forensic: Dealing with the application of scientific knowledge to legal problems and legal proceedings as, for example, in forensic anthropology, forensic dentistry, forensic experts, forensic medicine (legal medicine), forensic pathology, forensic science, etc.

Forensic Alcohol Analyst: A person employed by a forensic alcohol laboratory who performs the technical procedures of forensic alcohol Analysis and Forensic Drug Toxicology.

Forensic Alcohol Laboratory: Means a place at which specialized apparatus, instruments, and methods are used by trained laboratory personnel to measure the concentration of alcohol in samples of blood, breath, urine or tissues of persons involved in traffic accidents or in traffic violations.

Forensic Evidence: Evidence that is obtained by the application of scientific methods and is susceptible to use in court proceedings. Something that can help identify the responsible persons, establish an element of crime, reconstruct crime events or link crimes.
Forensic Specimen: Specimen collected in the knowledge that there will probably be litigation relating to the case. Requires complete, accurate identification of the specimen, victim and suspect and that a separate reserve specimen be kept for any further testing required by the court. All containers should be sealed so that they cannot be tampered with, and preferably in the presence of witnesses.

Gas Chromatograph: Instrument used in identifying and quantifying ethanol and other volatiles.

Jurisdiction: The area and matters over which a court has legal authority. When a proceeding in respect of a certain subject matter can only be brought in one court, that court is said to have exclusive jurisdiction; when it can be brought in any one of several courts, they are said to have concurrent jurisdiction. Jurisdiction also signifies the geographical limits within which the judgments or orders of a court can be enforced or executed.

Physical Evidence: Physical evidence is any object, smell, marking or impression, no matter how small, which may assist the investigator in the reconstruction of the crime, lead to the identification of the criminal, provide a link between a crime and its victim, or a crime and its perpetrator. It can be as large as a house, small as a fiber, or ingenious as an odor.

Post Mortem: After death.

Prosecution: The institution or conduct of legal proceedings against a person accused of a crime. The Prosecutor is responsible for the investigation and prosecution of persons who bear the greatest responsibility for serious violations of law and crimes.

Sample or Specimen: A representative portion of breath, blood, urine, or other material taken for the purpose of measuring the alcohol and/or drug concentration.

Serum: The liquid portion of a whole blood sample with the red and white cells removed.

Suspect: Someone who is under suspicion of having committed a crime. If the individual is formally charged with an offence, the reference is generally to a defendant or an accused, rather than a suspect. Both have rights under international law.

Toxicology: The testing of urine and blood for drugs of abuse, including alcohol and other drugs which may cause impairment.

Universal Precautions: "Universal precautions," as defined by CDC, are a set of precautions designed to prevent transmission of Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and other bloodborne pathogens when providing first aid or health care. Under Universal Precautions, blood and certain body fluids of all patients are considered potentially infectious for HIV, HBV and other bloodborne pathogens.

PURPOSE OF FORENSIC SPECIMENS

The objective of forensic evidence, such as blood specimen collection, is to prove or exclude a physical connection between individuals, objects or places. Such evidence consists of a wide
variety of substances or objects, the analysis of which requires specific, often specialized scientific skills. If the collection and handling specimens are not proper, wrong interpretations can result and sometimes the results obtained cannot be admissible as proper evidence in courts of law. It is critical to correctly document, collect, and preserve this type of evidence. Improperly handled physical evidence and blood specimens can weaken or destroy a potential source of facts in a case. Always collect and handle specimens according to the state laws and follow a standard operating procedure.

CONSIDERATIONS AFFECTING ALL TYPES OF SPECIMENS

- Failure to label a specimen correctly and to provide all pertinent information required on the test request form
- Insufficient quantity of specimen to run test or QNS (quantity not sufficient).
- Failure to use the correct container/tube for appropriate specimen preservation
- Inaccurate and incomplete instructions prior to collection
- Failure to tighten specimen container lids, resulting in leakage and/or contamination of specimens
- Failure to maintain the specimen at the appropriate temperature requirement
- Failure to wear clean, unused gloves

Forensic specimens:

- Failure to use vials and vacutainers that comply with state regulations and statutes
- Using a non alcohol-based antiseptic to cleanse the skin
- Failure to follow chain of custody
- Failure to note expiration dates on vials
- Failure to have venipuncture collection observed by law enforcement official
- Failure to label specimen tubes and obtain officer’s initials on the tubes
- Failure to place an evidence seal across the top the tube and initial the tube

SAFETY AND DISPOSAL CONSIDERATIONS: UNIVERSAL PRECAUTIONS

Because it is often impossible to know which might be infectious, all collected blood specimens must be treated with Universal Precautions. In all settings in which specimens are collected and prepared for testing, laboratory and health care personnel should follow current recommended sterile techniques; including precautions regarding the use of needles and other sterile equipment, as well as guidelines for the responsible disposal of all biological material and contaminated specimen collection supplies. For all those who are involved in specimen collection and preparation, the responsibility to adhere to current recommendations designed to maintain the safety of individuals and health care workers does not end when the individual is dismissed.

CONSENT

Hospitals and other settings are encouraged to assist law enforcement in the collection of forensic specimens. Examinations and collection of physical evidence for individuals placed under arrest and victims of crimes must be authorized by a law enforcement agency and paid
for at public expense. In some jurisdictions, persons who have been placed under arrest do not have the right to refuse an examination for the collection of physical evidence such as dried secretions, foreign materials and blood alcohol/drugs. If the suspect is in custody and refuses the evidence collection, and if the law enforcement officer believes the delay would result in the loss or destruction of evidence, the law enforcement officer will give permission for the specimen collection.

In cases where the subject is a minor, consult with local law enforcement agencies and follow local policies.

In a death, permission is not necessary where the official state or local medical examiner (coroner), or other designated official has discretionary power (by law) to order an autopsy to determine the cause and manner of death.

Follow local protocol for specimen collection and consent issues. Hospitals and non clinical settings often have separate consent forms. Obtain written consent before the collection of blood specimens.

LABELING BLOOD VIALS AND CONTAINERS

All items of evidence must be clearly labeled to enable the person who collected the evidence to later identify it in court and to ensure that the chain of custody is maintained. The blood sample tube or vial must be sealed and placed in a blood alcohol envelope.

Label all vials or tubes with the following information:

1. Full name of subject/victim
2. Date and time of collection
3. Initials of witnessing officer
4. Initials of person drawing the blood

Label blood sample envelopes with the following information:

1. Full name of subject
2. Subject driver’s license number
3. Submitting agency
4. Geographical location where blood sample was drawn; i.e., name and/or address of hospital, jail or other facility
5. Name of person drawing blood sample
6. Date blood sample drawn
7. Time blood sample drawn
8. Signature of witnessing officer
9. A form for establishing the chain of possession for all persons handling the evidence
10. Other information such as agency or laboratory number, offense charged, anatomical location from which blood sample was drawn, or any special instructions may be added

CHAIN OF CUSTODY
Accurately maintaining and accounting for the chain of custody of all evidence including evidence such as blood is essential for prosecution in a court of law. The chain of custody is a legal term describing the movement, location and succession of people responsible for the evidence. In order to maintain the chain of custody, an evidence kit and its contents must be accounted for from the moment collection begins until the moment it is introduced in court as evidence. Each item must be labeled with the initials of everyone who has handled it, the date, a description and source of specimen, the name of the collector, name of the subject, name and case number of the law enforcement agency involved in the investigation. To ensure integrity of the sample, once the envelope or container is sealed, it is never opened, except for analysis in the laboratory. Under **NO** circumstances is a suspect, victim, family member, or support person to handle or transport evidence after it has been collected. Never leave the subject or victim alone with the evidence.

**Web Search:** Follow the link below to read and learn more the content about, *Chain of Custody*.  [http://www.enotes.com/forensic-science/evidence-chain-custody](http://www.enotes.com/forensic-science/evidence-chain-custody)

**SPECIMEN COLLECTION TIME FRAME GUIDELINES**

Be aware that the presence of physical evidence, drugs and toxicants in any biological fluid is time-dependent. Timely collection of all forensic specimens including blood specimens is of the utmost importance. Alcohol related blood specimens should be collected within the first 45 minutes.

**DOCUMENTATION**

Ensure completion of all appropriate documentation. In situations where the subject has been medically evaluated, a record relating to the blood sample collection, including a copy of specimen’s chain of custody must be made in the medical record. This documentation ensures proper notation that a blood sample has been collected for forensic analysis and avoids repeated collection of the sample.

Where the blood sample has been collected without the physical presence of a law enforcement officer, the health care facility must immediately notify the nearest law enforcement agency of the sample collection. The collected forensic samples and accompanying Chain of Custody Record should be placed in a dedicated, secure and locked area for safekeeping.

In non-clinical settings, (e.g. law enforcement location), where a blood sample has been collected under the supervision of law enforcement, a forensic report is completed and the sample is handed directly to the officer requesting the collection.

**SEALING SPECIMEN CONTAINERS**
Blood evidence must be packaged in containers that are properly sealed. Proper sealing of the evidence ensures that contents cannot escape and that nothing can be added or altered.

**Proper sealing of evidence can be accomplished by:**

- Securely taping the envelope/container (do not lick the adhesive seal)
- Initialing and dating the seal by writing over the tape unto the evidence container
- Using tape, not staples to seal the container. Stapling is NOT considered a secure seal

**TRANSPORTATION AND TRANSFER OF BLOOD EVIDENCE**

**Transportation**
Under NO circumstances should a health care professional, family member, or support person, (e.g. advocate) handle or transport evidence, including blood evidence, after it has been collected.

**Transfer**
After collection, the specimen must be handed directly to the legal authority requesting the collection. All transfers of specimens to the law enforcement agency must be documented with the following information:

- Name of person transferring
- Name of person receiving
- Date of transfer

**Note:**

- Some jurisdictions also require documentation of time of transfer. Contact the local crime lab for their requirements.
- Only a law enforcement official or duly authorized agent should transport evidence such as blood samples from the collection site to a crime laboratory.

**STORAGE OF SPECIMENS**

Blood Evidence and its Chain of Custody Record must be stored in a secure area when not directly in the possession of a person listed in the chain of custody. Blood specimens are always refrigerated, NEVER frozen. Freezing blood in glass vials can cause them to crack, releasing volatile substances that may be present and compromising the integrity of the specimen.

**LIQUID WHOLE BLOOD SPECIMENS**

Blood vials that are used for forensic samples contain anticoagulants to avoid clotting and preservatives to prevent alcohol formation. These colored vials contain the preservatives suitable for forensic blood typing and are specified by the local crime laboratory. Do NOT substitute other vials. Tubes with additives must be
thoroughly mixed. Erroneous test results may be obtained when the blood is not thoroughly mixed with the additive.

**Containers used for toxicology testing:**

- **Gray top vials:** (contain sodium fluoride and potassium oxalate) Useful for ALCOHOL AND DRUG toxicological testing and may NOT be used for DNA analysis.
- **Red top vials:** (no additives) Useful for conventional serological tests; less useful for DNA testing; can be used for pregnancy and HIV testing.
- **Yellow top vials:** (contain acid citrate dextrose solution) Useful for conventional serological testing and DNA testing.
- **Purple top vials:** (contain EDTA) Useful for DNA testing, may inhibit certain conventional serological tests. Requires full draw, slowly invert 5 - 8 times to prevent clotting and platelet clumping.

**VACUUM TUBES CONTAINING ADDITIVES (E.G. ANTICOAGULANTS, PRESERVATIVES, ClOT ACTIVATORS)**

**When using vacuum tubes containing an additive:**

1. Tap the tube gently at a point just below the top to release any additive adhering to the tube or top.
2. Permit the tube to fill completely to ensure the proper ratio of blood to additive. There will be some dead space at the top of the tube.
3. To ensure adequate mixing of blood with the anticoagulant or preservative, use a slow rolling wrist motion to invert the tube gently 5 - 8 times. Failure to invert tubes may lead to the formation of microscopic clots.
4. Do not use rapid wrist motion or vigorous shaking as this may contribute to hemolysis.
5. Check to see that all the preservative or anticoagulant is dissolved. If any preservative powder is visible, continue inverting the tube slowly until the powder is dissolved.
6. If multiple samples are being drawn, invert each specimen as soon as it is drawn. Do not delay. Place the tube upright in a rack as quickly as possible after collection.

**Note:** *The gel-barrier tube is an additive tube and should be inverted five to six times after collection.*

**FORENSIC BLOOD SPECIMEN COLLECTION TECHNIQUES**

When collecting blood specimens for forensic analysis, the following principles must be adhered to:

- Avoid contamination. Collect carefully. Ensure that specimens are not contaminated by other materials. Wear gloves at all times.
- Collect early. Collect forensic specimens, including blood samples, as soon as possible. (Alcohol related blood specimens should be collected within the first 45 minutes)
- Handle appropriately. Ensure that specimens are packed, stored and transported correctly.
- Label accurately. All specimens must be clearly labeled with the subject's name, collector's name, the type of specimen, date, time of collection, and law enforcement agency's name.
- Ensure security. Pack specimens to ensure that they are secure and tamper proof. Only authorized persons should be entrusted with the specimens.
- Maintain continuity. After collection, the handling of the specimen must be recorded.
- Document collection. Document details of all collection and handling procedures.

Note: Check with the local crime lab for protocols regarding the documentation and handling of specimens.

**TRIAGE**

Always respond to acute injury, trauma care and safety needs before collecting specimens. Acute medical needs take precedence over forensic needs. Utilize a private location within the examination facility for the collection of forensic specimens.

**COLLECTION AND HANDLING OF BLOOD**

Samples taken for forensic alcohol and drug analysis must be collected and handled in a manner as to ensure that the identity and integrity of the samples are maintained from collection to analysis and reporting. Policies pertaining to blood collection vary by jurisdiction. Collect samples in accordance with local policy.

Blood samples should be collected by venipuncture from living subjects as soon as feasible after an alleged offense and only by persons authorized such as licensed physician, licensed nurse, trained medical technician or persons trained in accordance with state regulations. The law enforcement officer must always witness the actual blood withdrawal procedure.

- Wear clean, unused gloves.
- Collect sufficient blood to permit duplicate determinations.
- Do not use alcohol or other volatile organic disinfectant to clean the puncture site. Aqueous benzalkonium chloride (Zephiran) or other suitable aqueous disinfectant can be used.
- Use sterile hypodermic needles syringes, or clean, dry vacutainer type holders with sterile needles.
- Deposit blood sample into a clean, dry sterile vial/container which is closed with an inert stopper.
- Fill vials to the maximum
- Ensure that an anticoagulant and a preservative is present in the vial.
- Invert filled tubes immediately and rock gently back and forth to mix
- Label and seal vial and envelope immediately after collection.
- Place the box and its contents with Chain of Custody Record in a cool secure area until ready for transport to a forensic laboratory.
- If collecting blood sample for drug analysis, obtain a list of medications being taken by subject.
Note:

- Vials have expiration dates, after which the vacuum in the vacutainer tube is NO longer warranted. Do not use vial after expiration date.
- Do not recap used needles. Discard directly into Sharp’s disposal container
- If kits are not available, follow jurisdictional policy for collection:
  - Use grey stoppered tubes containing sodium fluoride and potassium oxalate.
  - Wrap the tubes in an absorbent material and package in an envelope or container.
  - Label and seal appropriately.
  - Store in a secure area, until it is ready for transport to a forensic laboratory.
  - Refrigerate the sample, DO NOT FREEZE.

Web Search: California Students: Follow the link below and read the required standards as dictated by the California Bureau of Forensic Services.

**BLOOD ALCOHOL COLLECTION KITS**

Blood Alcohol Collection Kits are available in some jurisdictions and can be used for specimen collection. Use of these kits assures complete compliance with jurisdictional policy. The kits contain labels, seals, vacuum tubes, alcohol free swabs, instructions for the technician, consent forms pre-addressed mailing label and serves as a mailing carton.

Note: Blood test kits have expiration dates. After the expiration date, the vacuum in the vacutainer tube is NO longer warranted.

Collection procedure (according to jurisdictional policy):

- Prior to use, confirm the kit is sealed and has not expired.
- Remove all components from Kit box
- If applicable, fill out all information on the consent form and have subject sign. *(In some jurisdictions the arresting officer can order the blood to be drawn and has the legal right to grant permission for consent… i.e. California).*
- Cleanse the skin with alcohol free prep pad provided. Using needle, needle holder and tubes provided, withdraw specimen from subject, allowing both tubes to fill to maximum.
- Return specimen and components to box
- Label and seal appropriately
- Store in a secure locked area until ready for mailing
- If storing, refrigerate, DO NOT FREEZE.

Remember: If collecting blood samples for drug analysis, obtain a list of medications being taken by subject.

**FORENSIC URINE EXAMINATIONS**

Follow jurisdictional policy:
• Obtain list of medications being taken by subject
• Fill in ALL the information on the collection bottle, labels, and submittal form.
• Observe subject while urinating
• The specimen must be deposited directly in a clean, dry container which also contains a preservative. The specimen should fill half the container.
• Secure lid tightly and attach one security seal provided
• Place sealed container in the provided plastic biohazard bag
• Place biohazard bag with enclosed specimen container and the completed form in the provided mailing container, if mailing.
• Secure mailing container with security seal
• Store sample in a cool secure locked area until ready for mailing, or submit the sample to the appropriate lab immediately.

Whenever a sample is requested by the defendant for analysis and a sufficient sample remains, the forensic alcohol laboratory or law enforcement agency in possession of the original sample must continue such possession, and provide the defendant with a portion of the remaining sample in accordance with the lab or agency policies and procedures. The samples must be provided in a clean container together with the identifying information carried on the original sample container to include the subject's name and a unique identification number.

Note: In order to allow for analysis by the defendant, the remaining portion of the sample must be retained for one year after the date of collection.

Remember: Deliver or mail sample as soon as possible! Best results are obtained if the specimen is received at the lab within 24-hours of collection. Delay may impact the lab’s ability to confirm suspected drugs. DO NOT LEAVE SAMPLE IN HOT PATROL CAR!

Web Search: California Students: Follow the link below and read the required standards as dictated by California Bureau of Forensic Services. Urine as a Sample for Alcohol Determination: http://www.cci.ca.gov/Reference/peb/peb1.pdf

CONSIDERATIONS AFFECTING URINE SPECIMEN COLLECTION

• Failure to obtain a clean-catch, midstream specimen
• Failure to refrigerate unpreserved specimen or store in a cool place
• Failure to refrigerate unpreserved specimen or store in a cool place during collection period (i.e., 24-hours)
• Failure to observe the proper preservative in the urine collection container prior to collection of the specimen
• Failure to provide proper mixing of specimen with urine preservative
• Failure to provide sufficient quantity of sample to meet minimum fill line on preservative transport container
• Failure to provide an appropriate collection container
• Failure to tighten specimen container lids, resulting in leakage of specimen
• Failure to divide specimen into separate containers for tests with such requirements
BREATH ALCOHOL ANALYSIS

Evidential breath alcohol analysis shall be performed in accordance with standards set forth by state regulations. Breath alcohol analysis shall be performed only with instruments for which the operators have received training and demonstrated competency through written and/or practical examination. Breath alcohol analysis may be performed by operators who do not meet the requirements of a forensic alcohol analyst, if they have received training for a specific instrument under a training program supervised by laboratories engaged in the practice of forensic alcohol analysis.

POST MORTEM SPECIMENS FOR FORENSIC ALCOHOL ANALYSIS

Post mortem specimens and cases are considered to be forensic in nature. When blood samples are collected post mortem, all practical precautions to insure an uncontaminated sample must be taken, such as:

- Samples shall be obtained prior to the start of any embalming process.
- Blood samples shall not be collected from the circulatory system effluent during arterial injection of embalming fluid.
- The sample should be taken from a major vein or heart. Care should be taken to avoid contamination by alcohol from the gastrointestinal tract directly or by diffusion.
- Post-mortem samples shall contain a preservative, (follow jurisdictions policy).
- In post-mortem cases, original blood samples shall be retained at the forensic laboratory or law enforcement agency for at least 1 year after date of collection.
- As with all forensic blood samples, when a sample is requested by the defendant, the agency or laboratory in possession of the sample must provide the defendant with a portion of the remaining sample in accordance with jurisdictional policies. The sample shall be provided in a clean container together with the identifying information carried on the original sample container. The information on the defendant’s sample must include the anatomic site of origin of the specimen, subject’s name, date and time of collection, name of collector, and a unique numerical identifier.

Note:

- Preservation of the chain of custody is of critical importance for all post-mortem specimens
- For post-mortem specimens, it is especially important that the recommended labeling and shipping requirements on the kits are followed.
- Blood: Each blood specimen should be identified as to anatomic site of origin (e.g. femoral vein, left ventricle, etc)
- Post-mortem blood specimens should NOT be frozen

GUIDELINES FOR SPECIAL FORENSIC CASES

Deaths during hospitalization: In hospital death cases, it is very important to collect and preserve blood and other samples taken on admission, as well as specimens drawn during the hospital stay. These specimens, which may contain the highest concentrations of the causative agent(s), are often discarded soon after the patient is discharged or dies. Immediate collection and preservation of these specimens, with chain of custody, may be crucial in resolving the
case. In addition, all medications administered in the hospital should be listed. Physical evidence including IV bags and lines, in-room biological waste containers, etc. should also be collected. Contact your local crime laboratory for any concerns regarding collection of forensic specimens in these cases.

FORENSIC ALCOHOL LABORATORY

The Forensic Alcohol Laboratory performs alcohol and drug analysis on blood and urine samples taken from subjects believed to be driving under the influence. The specimens submitted to the laboratory are analyzed according to strict state regulations. The laboratory performs toxicology screens on blood or urine at the request of law enforcement.

All forensic laboratories must meet the state’s standards of performance with a specificity which is adequate and appropriate for traffic law enforcement. Each laboratory must demonstrate a quality control program and proficiency testing as required under state requirements and each person performing the analysis must meet the qualifications set forth by the state.
REFERENCES

Forensic Alcohol Analysis, Article 1
http://www.cdph.ca.gov/services/boards/farc/Documents/PatriciaLough-
CACLDProposedRevisionsToTitle17.pdf

Medicine.Net.com

The Collection and Handling of the Blood Alcohol Specimen

The California Medical Protocol for Examination of Sexual Assault and Child Abuse Evidence
Collection Guidelines

DNA.gov: Chain of Custody

West Virginia State Police Laboratory Field Manual
http://www.legis.state.wv.us/Joint/Postaudit/PA_Report/audit_docs/PA_2008_60.pdf

Idaho Physical Evidence Collection Manual
http://www.isp.state.id.us/forensic/evidence_handbook.pdf

Vermont Department of Health: Breath and Blood Alcohol Analysis
http://healthvermont.gov/regs/breath_bloodalcohol_analysis.pdf