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INTRODUCTION

The Oklahoma State Bureau of Investigation (OSBI) Criminalistics Services Division (CSD) Forensic Toxicology training program was developed to train individuals in the examination of items of evidence for the presence of ethyl alcohol and/or other intoxicating substances. Items of evidence may include: blood, urine, and suspected alcoholic beverages. This program seeks to combine rigorous independent study, academy/classroom style training with peers and trainer(s), and mentor-based supervised completion of tasks, as applicable. Modules are mandatory and described in the following outlines. Criminalist positions are required to complete modules 1 through 15. Laboratory technician/analyst positions will be required to complete module 16 only and designated routine maintenance and reagents/standards. Modules may be completed out of order at the discretion of the Forensic Toxicology Unit (FTU) Technical Manager and/or a designee. Laboratory exercises may be substituted at the discretion of the FTU Technical Manager. If an exercise substitution occurs, it will be documented in the trainee's training manual and will include a justification for the substitution. All training will be handled according to QP 19 and shall be recorded and maintained in the trainee's training manual. Results of all exercises as well as any additional training completed (i.e., articles read, samples analyzed, mock cases worked, etc.) and justification for said training, will be documented and maintained with the trainee's training manual. All cases used for exercises shall be non-casework or mock samples. An authorization to work (ATW) will be issued after training is complete, updated as necessary per QP 19, and reviewed annually. An ATW may be issued for specific tasks during training at the discretion of the FTU Technical Manager. Analysts are encouraged to continue to advance their knowledge in the field of toxicology by attending professional meetings, workshops, webinars, and other continuing education courses. Analysts shall remain proficient in each type of work listed on their ATW.

COORDINATION OF THE PROGRAM

The FTU Technical Manager retains overall responsibility for the Forensic Toxicology Training Program. The training coordinator is the FTU Technical Manager and/or their designee. The coordinator facilitates the overall training, but may delegate certain duties and blocks of instruction to other qualified individuals.

TRAINING PERIOD

In accordance with QP 19.II.B.2, "Prior to training any individual, an assessment should be done to identify his/her specific training needs. This assessment may include a review of his/her education, experience, and/or a quiz or other competency evaluation to assess his/her knowledge/skill level." The length of the training period is variable and is at the discretion of the FTU Technical Manager or their designee. Certain individuals may require less time than others, depending on experience, education, or learning ability. Generally, the training period is completed within 12 months.

RE-TRAINING

This training manual can be modified by the FTU Technical Manager for re-training purposes, including a criminalist returning to the forensic toxicology unit from another discipline or a criminalist needing re-training in a specific area for remedial reasons. All re-training will be handled according to QP 19.

LOCATION OF TRAINING

The Oklahoma State Bureau of Investigation, Forensic Science Center, Forensic Toxicology Laboratory.

ETHICS IN FORENSIC SCIENCE

This section is covered in the OSBI CSD New Employee General Training Manual. See additional required reading below.

Trainee initials	Date	Literature
		Society of Forensic Toxicologists' Code of Ethics (https://www.soft-tox.org/assets/docs/SOFT_Ethics_Procedures.pdf)

GENERAL KNOWLEDGE OF FORENSIC SCIENCE

This section is covered in the OSBI CSD New Employee General Training Manual.

FORENSICS IN THE COURTROOM

This section is covered in the OSBI CSD New Employee General Training Manual. See additional required readings and discussions below.

Trainee initials	Date	Literature
		§47-751. Implied Consent to Breath Test, Blood Test or Other Test for Determining Concentration of Alcohol or Other Intoxicating Substance https://www.oscn.net/applications/oscn/Index.asp?ftdb=STOKST&level=1
		§47-752. Procedure for Blood Tests – Authorization – Liability for Withdrawal - Reports
		§47-753. Refusal to submit to test – Revocation of License – Reinstatement of License
		§47-754. Filed Report – Revocation or Denial of Driving Privilege – Appeal Hearing
		§47-756. Admission of Evidence Shown by Tests
		§47-757. Other Competent Evidence – Admissibility
		§47-759. Board of Tests for Alcohol and Drug Influence – Members – Authority – Rules – Revolving Fund

		§47-761. Operation of Motor Vehicle While Impaired – Penalties – Suspensions – Violations Not Bondable
		§3-301. Operation of Aircraft Under the Influence of Any Intoxicants – Definitions – Violation and Penalties – Treatment for Substance Abuse
		§3-302. Implied Consent to Blood or Breath Tests to Determine Alcohol Concentration
		§3-303. Persons Who May Withdraw Blood or Collect Specimens to Determine Alcohol Content – Liability – Independent Analysis – Costs – Admissibility as Evidence – Report
		§63-4210. (Public Health & Safety) Reckless or Negligent Operation of Parasails, Water Skis, Surfboards, etc. – Alcohol – Yielding Right of Way – Overloading – Speed Limits – Violations
		§37A-6-101. Prohibition Acts – Violations – Penalties, Section D
		§21-651. (Crimes & Punishments) Administering Poison with Intent to Kill
		§21-1114. Rape in the First Degree – Second Degree
		Additional overview of applicable Oklahoma State Statutes (as needed)

Trainee initials	Trainer initials	Date	Discuss the following:
			Differences in revocation appeals and criminal hearings
			Drug scheduling as it relates to toxicology and impaired driving

OVERVIEW OF FORENSIC SCIENCE

This section is covered in the OSBI CSD New Employee General Training Manual. See additional recommendation below.

Trainee initials	Date	Tasks and Literature
		Review https://oklahoma.gov/osbi.html using Google Chrome (Criminal History Request, Investigative Services, Statistical Analysis Center, Forensic Services: all disciplines)

QUALITY ASSURANCE

This section is covered in the OSBI CSD New Employee General Training Manual.

LABORATORY SAFETY, SECURITY, AND ADMINISTRATIVE PROCEDURES

This section is covered in the OSBI CSD New Employee General Training Manual.

COMPLETE ROUTINE MAINTENANCE

Maintenance should be observed by the trainee prior to the completion of the training program, if possible. The trainee will be supervised the first time they complete the

maintenance themselves. Some maintenance is not performed often and, therefore, may not be observed or completed by the trainee prior to completion of the training program. This will not prevent the trainee from being released for casework. All qualified analysts in the OSBI Forensic Toxicology Unit should, when feasible, inform the trainee when completing maintenance on the instruments. A checklist of all routine maintenance completed in-house is included at the end of the training manual.

REAGENT AND STANDARD PREPARATION

Reagent and standard preparation should be observed by the trainee, if possible, before being prepared by the trainee under direct supervision. The trainee will be supervised the first time they prepare a reagent or standard. Directions for preparation of reagents and standards are included in the Toxicology Standard Operating Procedures Manual. Some reagents and standards are not made often and, therefore, the trainee may make them for use with their training cases to complete this training requirement when feasible. The trainee will not be required to have made all possible standards and reagents before being released for casework. All qualified analysts in the OSBI Forensic Toxicology Unit should, when feasible, inform the trainee when preparing reagents or standards. A checklist of reagents and standards is included at the end of the training manual.

MODULE 1. ORIENTATION

1.1. Minimum Requirements for Orientation

1.1.1. Overview of:

1.1.1.1. Toxicology Training Manual

1.1.1.2. Toxicology Quality Manual

1.1.1.3. Toxicology Standard Operating Procedure Manual

1.1.1.4. Criminalistics Services Division (CSD) Quality Manual

1.1.1.5. Evidence Management

1.1.2. Introduction to the technical capabilities of the Forensic Toxicology Laboratory

1.1.3. Explanation of the purpose of the training program including an insight into the course of events and what the trainee is expected to accomplish

1.1.4. Introduction to the LIMS system

Estimated Time for Completion: **One Week** **Trainer Initials:** _____ **Date of Completion:** _____

1.1.5. Literature Review

Trainee initials	Date	Review the Following:
		Klaassen, C. D. (2019). Principles of Toxicology. In *Casarett & Doull's Toxicology the Basic Science of Poisons* (9th Ed., pp. 25-60). New York, NY: McGraw-Hill Education.
		(Optional) Klaassen, C. D. (2019). The Evolving Journey of Toxicology: A Historic Glimpse. In *Casarett & Doull's Toxicology the Basic Science of Poisons* (9th Ed., pp. 3-21). New York, NY: McGraw-Hill Education.

1.1.6. Comments

MODULE 2. EVIDENCE RECEIVING AND HANDLING

2.1 Learning Objectives

2.1.1 Understand evidence handling procedures used by CSD as detailed in the CSD Quality Manual

2.1.2 Understand evidence handling procedures pertinent to the Forensic Toxicology Unit

2.1.3 Understand the importance of safety regarding the handling of biological evidence

2.1.4 Receive, inventory, and itemize OSBI blood specimen collection kits, alcoholic content cases, and drug facilitated sexual assault (DFSA) cases for analysis

Estimated Time for Completion: One Month **Trainer Initials:** _____ **Date of Completion:** _____

2.2 Methods of Instruction

2.2.1 Literature Review

Trainee Initials	Date	Review the following:
		CSD Quality Manual and Procedures
		CSD Quality Manual QMA 2: Evidence Acceptance Requirements
		CSD Quality Manual QMA 3: Evidence Packaging and Sealing Requirements
		CSD Quality Manual QP 5: Evidence Intake
		CSD Quality Manual QP 6: Evidence Handling (6.1, 6.3.II.E, 6.3.II.F, 6.4)
		CSD Quality Manual QP 7: Evidence Transactions
		Toxicology Quality Manual: Sample Handling and Storage
		§47-752. Procedure for Blood Tests – Authorization – Liability for Withdrawal – Reports https://www.oscn.net/v4/

2.2.2 Observations

Trainee Initials	Trainer Initials	Date	Observe the following:
			A minimum of two analysts receive and inventory approximately 63 cases of evidence total
			An evidence technician complete the evidence intake process for at least one blood kit
			The secure storage of evidence before, during, and after analysis

			The proper use of chain of custody (obtain a personal barcode)
			Use of the LIMS system to create worklists for TX04 and TX05
			Performance of a custody inquiry
			Labeling of glassware for TX04 and TX05
			Preparing a sample to be sent out for independent analysis

2.2.3 Laboratory Exercises (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the following:
			Inventory approximately 42 cases
			Create worklists and label glassware as needed for laboratory staff
			Pipetting exercise

2.2.4 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test**.**

2.2.5 Competency Test

A competency will be given to show the trainee's competence of inventorying blood alcohol kits. The FTU Technical Manager will randomly select ten cases from the 21 unsupervised exercise cases to evaluate for the competency test. A satisfactory competency test will be a 90% based on the kit inventory grading rubric.

If Artel is used for the pipetting exercise, the results of the three pipettes used with the Artel system will constitute a competency test for the use of the Artel system. A satisfactory result will be a result within ±10% of the known volume. If the results are not within ±10%, the pipette will be verified by the trainer using the balance. If the results are within ±10% of the known volume, the competency will be repeated. If the results are not within ±10% of the known volume when tested by the trainer, a different pipette with the same known volume will be checked by the trainer as mentioned above. Once an acceptable pipette has been located, the competency will be repeated.

2.3 Reflection Questions

2.3.1 What does the OSBI CSD Forensic Toxicology laboratory do with biological specimens after receiving them to preserve their condition?

2.3.2 How is DUI/DUID evidence typically submitted?

2.3.3 Whenever toxicology evidence is not actively being analyzed, where should it be stored?

2.4 Comments

Inventory Approximately 42 Cases: If previously analyzed case samples are used, they shall not be cases currently in process or currently in the four-month holding process. Cases may also be mock samples. At least one case should be a mock DFSA case. At a minimum, the first 21 cases will be inventoried under direct supervision of qualified laboratory personnel. If not directly supervised for the remaining cases, then the trainer will verify all cases were inventoried correctly. Additional samples may be pulled/created at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to inventory additional cases if desired. If the trainee appears deficient, this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises.

Create Worklists and Label Glassware: Create worklists and label glassware for at least one analyst. For TX05, position numbers should be on the worklist. TX05 glassware should have both the position number and laboratory case number. All other glassware should have the laboratory case number.

Pipetting Exercise: Place a weigh-boat on the balance and tare the balance. Using a pipette, weigh out a known volume (10, 20, 25, 50, 100, 200, 250, 500, and 1000 µL) of distilled water and record the weight of the water using the appropriate number of significant figures. Perform each volume-weight measurement three (3) separate times, recording the weights; in doing so, record weight 1 first for all increasing volumes, then repeat and record weight 2 and finally, weight 3. Then determine the mean weight for each volume. Results of the exercise must be within ±10% of the known volume. If the results are not within ±10%, then the exercise will be repeated until the trainee can satisfactorily complete the exercise. This exercise can be completed on the Artel system for three of the pipette volumes if all necessary reagents are available. If completed using the Artel system, the trainee will observe the process of verifying a pipette using the Artel system prior to beginning the pipetting exercise. The balance should be used for the remaining volumes. If the Artel system is used, the trainer will review the results. If the results are satisfactory as listed above, the trainee will be considered competent in the use of the Artel system for pipette verification checks.

MODULE 3. BLOOD ALCOHOL ANALYSIS

3.1 Learning Objectives

3.1.1 Understand the theory and application of headspace gas chromatography (GC)

3.1.2 Comprehend the function and operation of the headspace GC

3.1.3 Understand the use of internal standards, positive controls, and negative controls

3.1.4 Prepare case specimens for analysis and analyze by headspace GC

3.1.5 Operate the headspace GC

3.1.6 Calibrate the headspace GC and quantitate ethanol

3.1.7 Generate, evaluate, and interpret data using acceptance criteria

Estimated Time for Completion: **One Month** **Trainer Initials:** _____ **Date of Completion:** _____

3.2 Methods of Instruction

3.2.1 Literature Review

Trainee Initials	Date	Review the Following:
		Caplan, Y. H. & Goldberger, B. A. (2015). *Garriott's Medicolegal Aspects of Alcohol* (6th ed., pp. 25-41 & 195-209). Tuscon, AZ: Lawyers and Judges Publishing Co.
		Toxicology Standard Operating Procedures Manual: TX05 Ethanol Analysis by Headspace Gas Chromatography
		Levine, B. (2020). Alcohol. In *Principles of Forensic Toxicology* (5th Ed., pp. 287-316). Switzerland: Springer.
		O.S. §47-751 – 759 Implied Consent to Breath, Blood, or Other Test for Determining Concentration of Alcohol or Other Intoxicating Substance https://www.oscn.net/v4/
		(Optional) Saferstein, R. (2002). The Determination of Alcohol in Blood and Breath. In *Forensic Science Handbook Volume I* (2nd Ed., pp. 637-657). Englewood Cliffs, NJ: Prentice-Hall.

3.2.2 Discussion

Trainee Initials	Trainer Initials	Date	Discuss the Following:
			Homogenizing a sample
			Per se limits

3.2.3 Observations

Trainee Initials	Trainer Initials	Date	Observe the Following:
			Operation of the headspace GC

			Preparation of calibrators, quality controls, and verifiers
			Specimen preparation for blood alcohol
			Use of blood alcohol concentration (BAC) control chart
			Results interpretation

3.2.4 Laboratory Exercises (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Curve exercise (10)
			Precision exercise
			Curve volume exercise (3)
			Analysis of previously analyzed/mock cases (63)
			Reagent and standard preparation

3.2.5 Necessary Equations

Mean $$\bar{x} = \frac{\sum x}{n}$$

Standard Deviation $$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}}$$

Coefficient of Variation $$CV = \frac{s}{\bar{x}} \cdot 100\%$$

3.2.6 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

3.2.7 Competency

A competency will be given to show the trainee's competence of blood alcohol analysis. A satisfactory competency test will be within ±10% of the expected value. The FTU Technical Manager or trainer will prepare the competency and record the expected value.

3.3 Reflection Questions

3.3.1 Describe the basic principles of GC.

3.3.2 What is mobile phase and what is used as a mobile phase for this analysis? How is it different from the stationary phase?

3.3.3 What is a stationary phase? What does it do in regards to the sample?

3.3.4 What is headspace when referring to alcohol analysis?

3.3.5 Describe how a flame ionization detector works.

3.3.6 Describe the gas chromatograph in laymen's terms.

3.4 Comments

NOTE: Begin preparing for alcohol mock trial

Curve Exercise: Analyze ten curves on ten different days before analyzing practice samples. The curves should include: volatile mix, 0.01, 0.1, 0.2, 0.3, and 0.4 g/100 mL, negative control, 0.08 positive control, low positive whole blood control, and high positive whole blood control. Once there have been ten successful curves, the trainee may begin analyzing training samples.

Precision Exercise: Analyze ten blank samples (deionized water and internal standard) as replicates and analyze ten ethanol samples (one level of an ethanol calibrator and internal standard) as replicates. From the peak area for the internal standard (ISTD) in both groups and the ethanol in the second group calculate the mean, standard deviation (SD), and coefficient of variation (CV) using Microsoft™ Excel. Results of the exercise must be within ±2 SD of the mean. If the results are not within ±2 SD, the exercise will be repeated until the trainee can satisfactorily complete the exercise.

Curve Volume Exercise: Pipette a BAC curve using different volumes of standards. Each curve should use the same pipette for the entire curve. Pick three of the following volumes for a total of three curves: 25 µL, 50 µL, 200 µL, 250 µL, or 500 µL. Using Microsoft™ Excel, use the peak areas of the internal standard and ethanol to calculate the ratio of the ethanol signal to the internal standard signal which can then be used to plot the calibration curve and calculate the r^2 value. Once the curve is plotted, calculate the ratios for the 0.08 standard and the low positive control (LPC) and high positive control (HPC) blood standards. Then use the curve to calculate their concentration. Do the different amounts cause any differences between the curves?

Analyze Approximately 63 Samples: If previously analyzed case samples are used, they shall not be cases currently in process or currently in the four-month holding process. Cases may also be spiked, mock samples. Results for all specimen matrices must be within 0.03 g/100 mL of previous ethanol quantitations or expected result. Any cases that do not meet this requirement will be reviewed on a case-by-case basis with the trainee, trainer, and FTU Technical Manager or designee. Outcomes can include: reanalysis of the case or a different case may be substituted. All cases must also meet all acceptance criteria listed in TX05 in the Toxicology Standard Operating Procedures Manual. Additional samples may be assigned at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to analyze additional cases if desired. If the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises and a competency test for this module.

MODULE 4. UNCERTAINTY OF MEASUREMENT

4.1 Learning Objectives

4.1.1 Understand uncertainty and its use

4.1.2 Comprehend the process of making an uncertainty budget

4.1.3 Learn how uncertainty is calculated

4.1.4 Know where to find the uncertainty budgets for the Forensic Toxicology Unit

Estimated Time for Completion: **One Month** **Trainer Initials:** _____ **Date of Completion:** _____

4.2 Methods of Instruction

4.2.1 Literature Review

Trainee Initials	Date	Review the Following:
		Toxicology Quality Manual: Uncertainty of Measurement
		Toxicology Quality Manual: Pipettes
		Toxicology Quality Manual: Volumetric Glassware
		CSD Quality Manual QP 22 – Estimating Uncertainty of Measurement
		CSD Quality Manual QP 23 – Measurement Traceability
		CSD Quality Manual QP 24 – Calibration and Handling of Equipment
		CSD Quality Manual QP 25 – Reference Standards
		CSD Quality Manual QP 26 – Reference Materials
		International Laboratory Accreditation Cooperation (ILAC) – Introducing the Concept of Uncertainty of Measurement in Testing in Association with the Application of the Standard ISO/IEC 17025
		Levine, B. (2020). Measurement Uncertainty. In *Principles of Forensic Toxicology* (5th Ed., pp. 249-254). Switzerland: Springer.
		(optional) Eurachem/CITAC Guide – Quantifying Uncertainty in Analytical Measurement, 3rd Ed.

4.2.2 Discussion

Trainee Initials	Trainer Initials	Date	Discuss the Following:
			Sources of uncertainty
			Uncertainty budget
			Traceability
			Calculations

4.2.3 Laboratory Exercise (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Prepare an uncertainty budget
			(Pending funding) Uncertainty of Measurement courses

4.2.4 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

4.3 Reflection Questions

4.3.1 What are some common sources of uncertainty in forensic toxicology?

4.3.2 How often do pipettes have to be calibrated according to FTU policy?

4.3.3 How often does volumetric glassware have to be calibrated according to FTU policy?

4.3.4 There are multiple calibrated items in the FTU. How many of them require intermediate checks?

4.4 Comments

NOTE: Begin working through Modules 12 and 13 in preparation for Mock Trial

Prepare an Uncertainty Budget for TX05: Use the Toxicology Quality Manual: Uncertainty of Measurement section to complete the eight steps for the uncertainty analysis process. Define the measuring device or instrument used, list all possible uncertainty components and their specific uncertainty, determine which components are significant, and define the measurand. Be sure to include all calculations performed as well as the combined standard uncertainty for both the 95.45% and 99.73% coverage probabilities and the final resulting expanded uncertainty. Additional work may be required at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to analyze additional cases if desired. If the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises for this module.

Uncertainty of Measurement Courses: (Pending funding) Complete three uncertainty of measurement courses offered through RTI International. Courses: Introduction to Uncertainty in Forensic Chemistry and Toxicology, Uncertainty in Forensic Chemistry and Toxicology: Part 2, and Uncertainty in Forensic Chemistry and Toxicology: Part 3. Cost is approximately $125. https://forensicrti.org/

MODULE 5. ENZYME-LINKED IMMUNOSORBENT ASSAY

5.1 Learning Objectives

5.1.1 Understand the theory and application of enzyme-linked immunosorbent assay (ELISA)

5.1.2 Comprehend the function and the specifics of ELISA instrumentation

5.1.3 Use LIMS to prepare a list of specimens for analysis

5.1.4 Prepare and analyze controls and specimens by ELISA

5.1.5 Understand the use of the controls

5.1.6 Generate, evaluate, and interpret data using acceptance criteria

5.1.7 Perform routine maintenance on the ELISA instrumentation

Estimated Time for Completion: **One Month** **Trainer Initials:** _____ **Date of Completion:** _____

5.2 Methods of Instruction

5.2.1 Literature Review

Trainee Initials	Date	Review the Following:
		Toxicology Standard Operating Procedures Manual: TX04 ELISA Drug Screen
		Levine, B. (2020). Immunoassay. In *Principles of Forensic Toxicology* (5th Ed., pp. 177-196). Switzerland: Springer.

5.2.2 Observation

Trainee Initials	Trainer Initials	Date	Observe the Following:
			Operation of the TECAN
			Preparation of controls and samples for analysis
			Routine maintenance
			Use of ELISA control chart
			Processing case results
			Troubleshooting specimen quality and software errors

5.2.3 Laboratory Exercises (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Analysis of previously analyzed/mock cases
			Instrument maintenance

5.2.4 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

5.2.5 Competency

A competency will be given to show the trainee's competence regarding ELISA analysis. A satisfactory competency test will be a correct presumptive result for the sample.

5.3 Reflection Questions

5.3.1 How does ELISA work?

5.3.2 How does the B/B_o number work?

5.3.3 How many drugs/groups of drugs does the OSBI FTU currently test for?

5.3.4 What is meant by cross-reactivity?

5.4 Comments

NOTE: Be ready for Alcohol Mock Trial within the next month!

Analyze Approximately 63 Samples: If previously analyzed case samples are used, they shall not be cases currently in process or currently in the four-month holding process. Cases may also be spiked, mock cases. Results must correlate with previously recorded/expected results. Any cases that do not meet this requirement will be reviewed on a case-by-case basis with the trainee, trainer, and FTU Technical Manager or designee. Outcomes can include: acceptance based on "cutoff" differences between lots, reanalysis of the case, or a different case may be substituted. All cases must also meet all acceptance criteria listed in TX04 in the Toxicology Standard Operating Procedures Manual. If the trainee fails to identify the appropriate results, then additional samples may be pulled or repeated at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to analyze additional cases if desired. If the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises and a competency test for this module.

MODULE 6. PRINCIPLES OF PHARMACOLOGY & DRUG EFFECTS

6.1 Learning Objectives

6.1.1 Be familiar with the various classes of drugs encountered in the OSBI Forensic Toxicology Lab

6.1.2 Comprehend the pharmacology of major drug classes

6.1.3 Comprehend the effects of major drug classes on human behavior as it relates to effects on human performance

Estimated Time for Completion: **One Month** **Trainer Initials:** _____ **Date of Completion:** _____

6.2 Methods of Instruction

6.2.1 Literature Review

6.2.1.1 Pharmacology

Trainee Initials	Date	Review the Following:
		Burns, M. (2007). *Medicolegal Aspects of Drugs.* (2nd Ed., pp. 13-38, 71-82, 91-101). Lawyers & Judges Pub. Co, Inc.
		Levine, B. (2020). Pharmacokinetics and Pharmacodynamics. In *Principles of Forensic Toxicology* (5th Ed., pp. 91-106). Switzerland: Springer.

6.2.1.2 Central Nervous System Depressants

Trainee Initials	Date	Review the Following:
		Levine, B. (2020). Benzodiazepines. In *Principles of Forensic Toxicology* (5th Ed., pp. 317-331). Switzerland: Springer.
		Levine, B. (2020). Miscellaneous Central Nervous System Depressants. In *Principles of Forensic Toxicology* (5th Ed. Pp. 333-345). Washington DC: Springer.
		Couper, F. J. & Logan, B. K. (2004) *National Highway Safety Traffic Administration: Drugs and Human Performance Fact Sheets*. (pp. 29-33 & 39-43). Washington DC: DOT.

6.2.1.3 Amphetamines/Sympathomimetic Amines

Trainee Initials	Date	Review the Following:
		Levine, B. (2020). Amphetamines/Sympathomimetic Amines. In *Principles of Forensic Toxicology* (5th Ed., pp. 449-466). Washington DC: AACC Press.

		Couper, F. J. & Logan, B. K. (2004) *National Highway Safety Traffic Administration: Drugs and Human Performance Fact Sheets*. (pp. 61-71). Washington DC: DOT.

6.2.1.4 Marijuana

Trainee Initials	Date	Review the Following:
		Levine, B. (2020). Cannabis. In *Principles of Forensic Toxicology* (5th Ed., pp. 389-444). Switzerland: Springer.
		Couper, F. J. & Logan, B. K. (2004) Cannabis/Marijuana. In *National Highway Safety Traffic Administration: Drugs and Human Performance Fact Sheets*. (pp. 7-12). Washington DC: DOT.
		Elsohly, M. A. (2007). *Marijuana and the Cannabinoids*. (pp. 97-118 & 277-291). Totowa, NJ: Human Press Inc.

6.2.1.5 Opioids

Trainee Initials	Date	Review the Following:
		Levine, B. (2020). Opioids. In *Principles of Forensic Toxicology* (5th Ed., pp. 347-369). Switzerland: Springer.
		Couper, F. J. & Logan, B. K. (2004) *National Highway Safety Traffic Administration: Drugs and Human Performance Fact Sheets*. (pp. 55-59 & 73-78). Washington DC: DOT.

6.2.1.6 Cocaine

Trainee Initials	Date	Review the Following:
		Levine, B. (2020). Cocaine. In *Principles of Forensic Toxicology* (5th Ed., pp. 371-386). Switzerland: Springer.
		Couper, F. J. & Logan, B. K. (2004) Cocaine. In *National Highway Safety Traffic Administration: Drugs and Human Performance Fact Sheets*. (pp. 19-24). Washington DC: DOT.

6.2.1.7 Sedatives/Hypnotics

Trainee Initials	Date	Review the Following:
		Couper, F. J. & Logan, B. K. (2004) *National Highway Safety Traffic Administration: Drugs and Human Performance Fact Sheets*. (pp. 25-28, 35-38, 91-95). Washington DC: DOT.

		Logan, B. F. & Couper, F. J. (2001) Zolpidem and Driving Impairment, *Journal of Forensic Sciences*, (46(1): pp 105-110).

6.2.1.8 Hallucinogens

Trainee Initials	Date	Review the Following:
		Levine, B. (2020). Hallucinogens and Psychedelics. In *Principles of Forensic Toxicology* (5th Ed., pp. 467-487). Switzerland: Springer.
		Couper, F. J. & Logan, B. K. (2004) *National Highway Safety Traffic Administration: Drugs and Human Performance Fact Sheets*. (pp. 51-54 & 79-83). Washington DC: DOT.

6.2.1.9 Antidepressant Drugs

Trainee Initials	Date	Review the Following:
		Levine, B. (2020). Antidepressants. In *Principles of Forensic Toxicology* (5th Ed., pp. 491-508). Switzerland: Springer.

6.2.1.10 Miscellaneous Therapeutic Drugs

Trainee Initials	Date	Review the Following:
		Levine, B. (2020). Miscellaneous Therapeutic Drugs. In *Principles of Forensic Toxicology* (5th Ed., pp. 523-542). Switzerland: Springer.

6.2.1.11 Antipsychotic Drugs

Trainee Initials	Date	Review the Following:
		Levine, B. (2020). Neuroleptics (antipsychotics). In *Principles of Forensic Toxicology* (5th Ed., pp. 511-521). Switzerland: Springer.

6.2.2 Discussion

Trainee Initials	Trainer Initials	Date	Discuss the Following:
			Absorption, distribution, metabolism, excretion
			Drug classes and effects
			Drug Recognition Expert (DRE) and field sobriety tests
			Current drug trends in Oklahoma

6.2.3 Practical Exercise (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Drug presentation

6.2.4 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

6.3 Reflection Questions

6.3.1 What is the most common drug seen in the OSBI Forensic Toxicology Unit for DUI/DUID cases?

6.3.2 In general terms, how does a drug work through the body?

6.3.3 What is a DRE?

6.3.4 What is the difference between pharmacodynamics and pharmacokinetics?

6.4 Comments

Drug Presentation: Give a minimum of one presentation over a drug chosen by the FTU Technical Manager. The presentation should include, if applicable, the drug class, half-life, therapeutic dose, effects, if it is prescribed, what it is used for, ways to administer, DRE examination, etc. The exercise will be scored as “pass/fail” on content, coherence, speaking skills, and question responsiveness.

MODULE 7. QUALITATIVE GC/MS LLE & SPE ANALYSIS

7.1 Learning Objectives

7.1.1 Understand the methods used to prepare biological samples for chemical extraction

7.1.2 Comprehend the principles behind liquid-liquid extractions (LLE) and solid phase extractions (SPE)

7.1.3 Understand drug ionization

7.1.4 Comprehend the principles of partitioning of hydrophilic, lipophilic, and amphoteric drugs

7.1.5 Prepare samples for analysis and analyze by GC/MS

7.1.6 Understand use of positive and negative controls

7.1.7 Generate, evaluate, and interpret data using acceptance criteria

7.1.8 Perform routine maintenance on the GC/MS

Estimated Time for Completion: **One Month** **Trainer Initials:** _____ **Date of Completion:** _____

7.2 Methods of Instruction

7.2.1 Literature Review

Trainee Initials	Date	Review the Following:
		Toxicology Standard Operating Procedures Manual: TX01 Basic Drug Screen
		Toxicology Standard Operating Procedures Manual: TX09 Acids and Neutrals Drug Screen
		Levine, B. (2020). Chromatography and Mass Spectrometry. In *Principles of Forensic Toxicology* (5th Ed., pp. 135-161 & 197-220). Switzerland: Springer.

7.2.2 Observation

Trainee Initials	Trainer Initials	Date	Observe the Following:
			Reagent preparation
			Specimen preparation
			Identification of MS components
			Operation of data analysis software
			Troubleshooting specimen quality and software errors
			Use of mass spectral libraries
			Routine maintenance

7.2.3 Laboratory Exercises (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Analysis of previously analyzed/spiked samples
			Reagent and standard preparation
			Routine maintenance

7.2.4 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

7.2.5 Competency

A competency will be given to show the trainee's competence in both the basic drug screen and acid neutral drug screen. A satisfactory competency test will be a correct confirmatory result for each analysis.

7.3 Reflection Questions

7.3.1 How does the MS work (in both technical and layman's terms)?

7.3.2 How does a liquid-liquid extraction work?

7.3.3 How does a solid phase extraction work?

7.3.4 What types of maintenance can be performed in-house on the GC/MS?

7.4 Comments

Analysis of Previously Analyzed/Spiked Samples: If previously analyzed case samples are used, they shall not be cases currently in process or currently in the four-month holding process. Cases may also be spiked, mock cases. A minimum of 15 samples will be analyzed by basic drug screen and a minimum of five case samples will be analyzed by acid and neutral drug screen. They must be analyzed over a minimum of three days and, therefore, cannot all be analyzed on the same day. Results must correlate with previously recorded/expected results. Mass spectra from the OSBI toxicology library will need to be included for all identified compound(s) and internal standards and must include the retention index. Any cases that do not meet this requirement will be reviewed on a case-by-case basis with the trainee, trainer, and FTU Technical Manager or designee. Outcomes can include: reanalysis of the case or a different case may be substituted. All controls and samples must also meet all acceptance criteria listed in TX01 and TX09 in the Toxicology Standard Operating Procedures Manual. If the trainee fails to identify the appropriate results, then additional samples may be pulled or repeated at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to analyze additional cases if desired. If the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises and a competency test for this module.

MODULE 8. QUANTITATIVE GC/MS ANALYSIS

8.1 Learning Objectives

8.1.1 Comprehend Selected Ion Monitoring (SIM) versus scan methods
8.1.2 Understand the use of calibrators, controls, and blanks
8.1.3 Construct a calibration curve using an internal standard
8.1.4 Understand the criteria for acceptance of quantitative data
8.1.5 Prepare samples for analysis and analyze by GC/MS
8.1.6 Generate, evaluate, and interpret data using acceptance criteria
8.1.7 Perform routine maintenance on the GC/MS

Estimated Time for Completion: **One Month** **Trainer Initials:** _____ **Date of Completion:** _____

8.2 Methods of Instruction

8.2.1 Literature Review

Trainee Initials	Date	Review the Following:
		Toxicology Standard Operating Procedures Manual: TX36 Basic Drug Quantitation
		Levine, B. (2020). Quantitative Analytical Methods. In *Principles of Forensic Toxicology* (5th Ed., pp. 221-229). Switzerland: Springer.
		Agilent Technologies GC/MS Instrument Manuals (know location of and what information can be found there)

8.2.2 Discussion

Trainee Initials	Trainer Initials	Date	Discuss the Following:
			Difference between Limit of Detection (LOD) and Limit of Quantitation (LOQ)
			Reagent preparation
			Curve, controls, and specimen preparation
			Software calibration
			Generation of calibration curves
			Setting ion ratios

8.2.3 Observation

Trainee Initials	Trainer Initials	Date	Observe the Following:
			Identification of MS components
			Operation of data analysis software

			Troubleshooting specimen quality and software errors
			Routine maintenance

8.2.4 Laboratory Exercise (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Analyze a calibration curve and previously analyzed/spiked cases (2)

8.2.5 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

8.2.6 Competency

A competency will be given to show the trainee's competence of quantitative GC/MS analysis. A satisfactory competency test will be within ±20% of the expected ng/mL value.

8.3 Reflection Questions

8.3.1 What is the difference between a scan method and a SIM method?

8.3.2 What is the purpose of a blank?

8.3.3 What is the minimum number of points required by OSBI FTU policy for a calibration curve?

8.4 Comments

NOTE: Begin preparing for Drug Mock Trial!

Analyze a Calibration Curve and Previously Analyzed/Spiked Samples: Extract a standard curve with calibrators, controls, a blank, and a blood sample (in duplicate) on two different days for each GC/MS quantitation method validated for use in the OSBI Forensic Toxicology Unit. If previously analyzed case samples are used, they shall not be cases currently in process or currently in the four-month holding process. Cases may also be spiked, mock cases. Prepare a calibration curve using the calibration results and use it to determine the concentration of the controls and sample. The results should be within 20% of the previously recorded/expected result. If the results are not within 20%, the trainee will repeat the testing until they have two results that meet passing criteria. The trainee may also request to analyze additional cases if desired. If the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises and a competency test for this module.

MODULE 9. QUALITATIVE LC/MS-MS ANALYSIS

9.1 Learning Objectives

9.1.1 Understand the theory of liquid chromatography (LC)

9.1.2 Understand the theory of tandem mass spectrometry (MS-MS)

9.1.3 Comprehend the methods used to prepare biological samples for chemical extraction

9.1.4 Understand the criteria for acceptance of qualitative liquid chromatography tandem mass spectrometry (LC/MS-MS) data

9.1.5 Prepare samples for analysis and analyze by LC/MS-MS

9.1.6 Generate, evaluate, and interpret data using acceptance criteria

9.1.7 Perform routine maintenance on the LC/MS-MS

Estimated Time for Completion: **One Month** **Trainer Initials:** _____ **Date of Completion:** _____

9.2 Methods of Instruction

9.2.1 Literature Review

Trainee Initials	Date	Review the Following:
		Toxicology Standard Operating Procedures Manual: TX14 Cannabinoids in Blood by LC Tandem MS
		Toxicology Standard Operating Procedures Manual: TX34 Drug Identification and Confirmation by LC Tandem MS
		Toxicology Standard Operating Procedures Manual: TX38 Synthetic Cannabinoids by LC Tandem MS
		Toxicology Standard Operating Procedures Manual: TX39 Benzodiazepines, Cocaine, BE and Zolpidem by LC Tandem MS
		Toxicology Standard Operating Procedures Manual: TX40 Opiates by LC Tandem MS
		Toxicology Standard Operating Procedures Manual: TX42 Fentanyl and Fentanyl Analog Analysis by LC Tandem MS
		CSD Quality Manual QP 21.2: Evaluation of Methods, Instruments, Equipment, and Software
		Toxicology Quality Manual: Ensuring the Validity of Results
		Polettini, A. (2006). *Applications of LC-MS in Toxicology*. (pp. 12-19, 43-65, 97-108, and 149-181). London, UK: Pharmaceutical Press.
		Shimadzu's Instrument Manuals (know location of and what can be found in each one)

9.2.2 Discussion

Trainee Initials	Trainer Initials	Date	Discuss the Following:
			Validation requirements

9.2.3 Observation

Trainee Initials	Trainer Initials	Date	Observe the Following:
			Reagent preparation
			Instrument set-up
			Preparation and use of standards and controls
			Operation of data analysis software
			Troubleshooting specimen quality, chromatography, and software errors
			Qualitative reporting criteria
			Setting MRM ratios
			Routine maintenance

9.2.4 Laboratory Exercise (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Analysis of previously analyzed/spiked samples (4 each)

9.2.5 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

9.2.6 Competency

A competency will be given for extraction TX14, TX38, TX42, and one for a protein precipitation extraction (either TX34, TX39, or TX40) to show the trainee's competence of qualitative LC/MS-MS methods. A satisfactory competency test will be a correct confirmatory result for each analysis.

9.3 Reflection Questions

9.3.1 What are the differences between gas chromatography and liquid chromatography?

9.3.2 How does tandem mass spectrometry work?

9.3.3 What can cause peaks to shift during an analysis?

9.4 Comments

NOTE: Be ready for Drug Mock Trial within the next month!

Analysis of Previously Analyzed/Spiked Samples: If previously analyzed case samples are used, they shall not be cases currently in process or currently in the four-month holding process. Cases may also be spiked, mock cases. A minimum of four samples each will be analyzed by TX14, TX34, TX38, TX39, TX40, and TX42. They must be analyzed over a minimum of two days and, therefore, all samples for a specific procedure cannot be analyzed on the same day. However, samples for multiple procedures may be analyzed on the same day. Results must correlate with previously recorded/expected results. Any discrepancies will be identified and reviewed by the trainer to determine why there was a discrepancy. All controls and samples must also meet all acceptance criteria listed in the corresponding procedure in the Toxicology Standard Operating Procedures Manual. If the trainee fails to identify the appropriate results, then additional samples may be pulled or repeated at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to analyze additional cases if desired. If the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises and a competency test for this module.

MODULE 10. QUANTITATIVE LC/MS-MS ANALYSIS

10.1 Learning Objectives

10.1.1 Understand the criteria for acceptance of quantitative data by LC/MS-MS

10.1.2 Comprehend the use of data analysis software to prepare a calibration curve

10.1.3 Prepare samples for analysis and analyze by LC/MS-MS

10.1.4 Generate, evaluate, and interpret data using acceptance criteria

10.1.5 Perform routine maintenance on the LC/MS-MS

Estimated Time for Completion: One Month **Trainer Initials:** _____ **Date of Completion:** _____

10.2 Methods of Instruction

10.2.1 Literature Review

Trainee Initials	Date	Review the Following:
		Toxicology Standard Operating Procedures Manual: TX41 Quantitation of Drugs by LC Tandem MS
		ANSI/ASB Standard 036, First Edition 2019, Standard Practices for Method Validation in Forensic Toxicology

10.2.2 Discussion

Trainee Initials	Trainer Initials	Date	Discuss the Following:
			Use of quantitations in Forensic Toxicology
			Quantitative validation requirements

10.2.3 Observation

Trainee Initials	Trainer Initials	Date	Observe the Following:
			Reagent preparation
			Instrument set-up
			Preparation and use of standards and controls
			Operation of data analysis software
			Troubleshooting specimen quality, chromatography, and software errors
			Quantitative reporting criteria
			Setting MRM ratios

10.2.4 Laboratory Exercise (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Analysis of previously analyzed/spiked samples (4)

10.2.5 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

10.2.6 Competency

A competency will be given for each quantitation method to show the trainee's competence of quantitative LC/MS-MS methods. A satisfactory competency test will be a correct confirmatory result for each analysis.

10.3 Reflection Questions

10.3.1 When would a quantitation be completed on a forensic toxicology case?

10.3.2 What are the pros and cons of performing a quantitation in regards to the case?

10.3.3 What are the differences between a qualitative test and a quantitative test? (Include any differences in the extraction, data review, and use of data analysis software).

10.4 Comments

NOTE: Schedule Drug Mock Trial

Analysis of Previously Analyzed/Spiked Samples: If previously analyzed case samples are used, they shall not be cases currently in process or currently in the four-month holding process. Cases may also be spiked, mock cases. A minimum of four samples each will be analyzed in duplicate by TX41. They must be analyzed over a minimum of two days and, therefore, cannot all be analyzed on the same day and must be for at least two different drugs. The results must be within ±20% of the previously recorded/expected results. If the results are not within ±20%, the trainee will repeat the testing until they have four case results that meet passing criteria. All controls and samples must also meet all acceptance criteria listed in the corresponding procedure in the Toxicology Standard Operating Procedures Manual and Toxicology Quality Manual. If the trainee fails to obtain appropriate results, then additional samples may be pulled or repeated at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to analyze additional cases if desired. If the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises and a competency test for this module.

MODULE 11. VOLATILE ANALYSIS

11.1 Learning Objectives

11.1.1 Understand the chemistry of alcoholic beverages

11.1.2 Comprehend the function, theory, and operation of the GC/MS for headspace analysis

11.1.3 Prepare samples for analysis by headspace gas chromatography/mass spectrometry (GC/MS)

11.1.4 Analyze samples and determine the concentration of ethanol in the beverage

11.1.5 Generate, evaluate, and interpret data using acceptance criteria

Estimated Time for Completion: **One Month** **Trainer Initials:** _____ **Date of Completion:** _____

11.2 Methods of Instruction

11.2.1 Literature Review

Trainee Initials	Date	Review the Following:
		Toxicology Standard Operating Procedures Manual: TX43 Volatile Analysis by Headspace GC-MS
		Caplan, Y. H. & Goldberger, B. A. (2015). Chemistry of Alcoholic Beverages. In *Garriott's Medicolegal Aspects of Alcohol* (6th ed., pp. 1-21). Tuscon, AZ: Lawyers and Judges Publishing Co.
		Levine, B. (2020). Inhalants. In *Principles of Forensic Toxicology* (5th Ed., pp. 561-567). Switzerland: Springer.
		Couper, F. J. & Logan, B. K. (2004) Toluene. In *National Highway Safety Traffic Administration: Drugs and Human Performance Fact Sheets*. (pp. 85-89). Washington DC: DOT.
		Capron, B. & Logan, B. K. (2009) Toluene-Impaired Drivers: Behaviors Observations, Impairment Assessment, and Toxicological Findings. In *Journal of Forensic Sciences,* (54(2), pp. 486-489).
		National Institute on Drug Abuse (NIDA) DrugFacts Sheet – Inhalants. https://www.drugabuse.gov/publications/drugfacts/inhalants

11.2.2 Discussion

Trainee Initials	Trainer Initials	Date	Discuss the Following:
			Alcoholic Beverage Laws Enforcement (ABLE) Commission

11.2.3 Observations

Trainee Initials	Trainer Initials	Date	Observe the Following:
			A minimum of one alcoholic beverage content analysis will be observed from beginning to end by the Trainee
			Use of alcoholic beverage control chart
			Preparation of sample dilution
			Operation of headspace GC/MS
			Result calculation and interpretation

11.2.4 Laboratory Exercises (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Inventory mock alcoholic beverage content cases (3)
			Analyze mock alcoholic beverage content samples for presence of alcohol (3)
			Analyze mock inhalant cases (3)
			Reagent and standard preparation
			Instrument maintenance

11.2.5 Necessary Equations

EtOH % Volume = Amount (g/100 mL) * Dilution Factor (1:X) / Density EtOH (0.789g/100 mL)

11.2.6 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

11.2.7 Competency

A competency will be given to show the trainee's competence of alcohol content analysis. A satisfactory competency test will be within ±10% of the expected value. The Forensic Toxicology Unit Technical Manager or trainer will prepare the competency and record the expected value.

11.3 Reflection Questions

11.3.1 What does the ABLE Commission do?

11.3.2 What standards must be analyzed prior to analyzing any samples?

11.3.3 What is the density of ethyl alcohol?

11.3.4 What is the mobile phase for headspace GC/MS?

11.3.5 Describe how the mass spectrometer works.

11.3.6 What compounds can currently be identified by TX43?

11.4 Comments

Inventory Evidence for Three Mock Alcoholic Content Cases: Samples shall be mock cases. The cases will be inventoried under direct supervision of qualified laboratory personnel and itemized through the LIMS training database system. Additional mock cases may be created at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to analyze additional cases if desired. If the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises.

Analysis of Three Mock Alcoholic Content Cases: Samples shall be mock cases. They must be analyzed over a minimum of two days and, therefore, cannot all be analyzed on the same day. Results for all specimen matrices must be within ±10% of the expected result. Any cases that do not meet this requirement will be reviewed on a case-by-case basis with the trainee, trainer, and FTU Technical Manager or designee. Outcomes can include: reanalysis of the case or a different case may be substituted. All cases must also meet all acceptance criteria listed in the FTU Quality Manual – Ensuring the Validity of Results. Additional samples may be made at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to analyze additional cases if desired. If the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises and a competency test for this module.

Analysis of Three Mock Inhalant Cases: If previously analyzed case samples are used, they shall not be cases currently in process or currently in the four-month holding process. Cases may also be spiked, mock samples. They must be analyzed over a minimum of two days and, therefore, cannot all be analyzed on the same day. Results for all specimen matrices must identify the expected result. Any cases that do not meet this requirement will be reviewed on a case-by-case basis with the trainee, trainer, and FTU Technical Manager or designee. Outcomes can include: reanalysis of the case or a different case may be substituted. All cases must also meet all acceptance criteria listed in FTU Quality Manual – Ensuring the Validity of Results. Additional samples may be assigned at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to analyze additional cases if desired. If the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises and a competency test for this module.

MODULE 12. REPORT WRITING

12.1 Learning Objectives

12.1.1 Understand how to draft a report using the LIMS

12.1.2 Identify the contents of a case record for the Forensic Toxicology Unit

12.1.3 Comprehend how records are controlled within the CSD

Estimated Time for Completion: **One Month** **Trainer Initials:** _____ **Date of Completion:** _____

12.2 Methods of Instruction

12.2.1 Literature Review

Trainee Initials	Date	Review the Following:
		CSD Quality Manual QP 16.1: Control of Records
		CSD Quality Manual QP 16.2: Contents of Case Records
		CSD Quality Manual QP 28: Report Writing
		Toxicology Quality Manual: Reporting of Results
		§74-150.5. Investigations – Who May Initiate Investigation by Request – Confidentiality of Records

12.2.2 Discussion

Trainee Initials	Trainer Initials	Date	Discuss the Following:
			When information can be released
			Who can receive released information
			What can be discussed over the phone
			What will be logged as a narrative
			Tracking changes

12.2.3 Observation

Trainee Initials	Trainer Initials	Date	Observe the Following:
			Creating a narrative
			Review of data prior to drafting a report
			Drafting reports using the LIMS system

12.2.4 Laboratory Exercise

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Draft reports for competency cases in the LIMS

12.2.5 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

12.3 Reflection Questions

12.3.1 Who are we allowed to discuss case information with outside the OSBI?

12.3.2 What information should be included in the case file?

12.3.3 When should a narrative be created and what type of contact should be logged this way?

12.4 Comments

MODULE 13. COURTROOM BASICS

13.1 Learning Objectives

13.1.1 Be familiar with the functions of a criminal court proceeding

13.1.2 Understand how to present expert testimony

Estimated Time for Completion: One Month **Trainer Initials:** _____ **Date of Completion:** _____

13.2 Methods of Instruction

13.2.1 Literature Review

Trainee Initials	Date	Review the Following:
		OSBI Policies 108, 113, 115.9, and 226
		CSD Quality Manual QP 32: Testimony
		Caplan, Y. H. & Goldberger, B. A. (2015). *Garriott's Medicolegal Aspects of Alcohol* (6th ed., pp. 581-587, 591-639, and 641-654). Tuscon, AZ: Lawyers and Judges Publishing Co.
		Burns, M. (2007). *Medicolegal Aspects of Drugs.* (2nd Ed., pp. 155-168 and 177-186). Lawyers & Judges Pub. Co, Inc.

13.2.2 Discussion

Trainee Initials	Trainer Initials	Date	Discuss the Following:
			Normal progression of court
			How to address members of the courts
			Use of visual aids
			Appropriate explanation of results
			Appropriate court attire
			Subpoenas

13.2.3 Observations

Trainee Initials	Trainer Initials	Date	Observe the Following:
			Expert courtroom testimonies (as many as possible)
			Analyst preparation for court

13.2.4 Laboratory Exercises

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Practice testimony with other analysts
			Blood alcohol mock trial

			Drug Mock Trial

13.2.5 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

13.2.6 Competency

A competency will be given for both blood alcohol and blood drug analysis in the form of a mock trial. A satisfactory mock trial will be an average score of 2 on a scale of 0-3 (where 3 = excellent). Anything less, will require an additional mock trial. At a minimum, the trainers, FTU Supervisor, and FTU Technical Manager should be participants in the evaluation process. Designees may be used if necessary.

13.3 Refection Questions

13.3.1 What are some ways to prepare for court?

13.3.2 What types of visual aids may be beneficial in court?

13.3.3 What is appropriate court attire?

13.4 Comments

MODULE 14. COMPETENCY TESTS

14.1 Learning Objectives

14.1.1 Demonstrate proficiency in the handling and analyzing of evidence submitted to the Forensic Toxicology Unit

14.1.2 Display understanding in the area of forensic toxicology

14.2 Methods of Instruction

14.2.1 Competency Test

Competency test may be given out after each module involving evidence handling or testing to demonstrate proficiency. The competency test will be prepared by the FTU Technical Manager or designee based on the module being completed. The sample may be in urine, blood, or an alcoholic beverage and the results will not be known by the trainee until after all analysis has been completed, a report has been created, and said report has been technically reviewed. Satisfactory competency tests are defined in each module. Any discrepancies must be reviewed by the FTU Technical Manager and re-training conducted as necessary to achieve the expected results, prior to the test being accepted as satisfactory.

14.2.2 Toxicology Examination

Two oral examinations will be given during training covering forensic toxicology alcohol and drug analysis. Each will consist of questions covering the technical aspects of analyzing samples including instrumentation, calibration, and standard operating procedures. The examination will be administered by the FTU Supervisor, FTU Technical Manager, and/or other designees. A satisfactory score will be an 80% or higher.

14.2.3 Mock Trial

Refer to Module 13 “Courtroom Basics”

14.3 Completion

The trainee must successfully complete a competency test for each analysis type before being released to perform said testing independently. Upon the successful completion of all phases, a memo indicating the successful completion and approval for the trainee to begin analysis will be submitted by the FTU Technical Manager to the FTU Supervisor, the appropriate Criminalistics Administrator (CA), and the Quality Manager (QM). The memo should clearly specify the area of analysis the individual is approved to perform. An ATW will also be issued.

14.4 Comments

MODULE 15. TECHNICAL AND ADMINISTRATIVE REVIEWS

15.1 Learning Objectives

15.1.1 Understand technical review requirements

15.1.2 Comprehend each level of correction and when they should be used

Estimated Time for Completion: One Week **Trainer Initials:** _____ **Date of Completion:** _____

15.2 Methods of Instruction

15.2.1 Literature Review

Trainee Initials	Date	Review the Following:
		CSD Quality Manual QP 13: Nonconforming Work
		CSD Quality Manual QP 14.1: Class II Nonconforming Work
		CSD Quality Manual QP 14.2: Class III Nonconforming Work
		CSD Quality Manual QP 14.3: Class IV Nonconforming Work
		CSD Quality Manual QP 31: Reviews
		Toxicology Quality Manual: Technical/Administrative Reviews
		Toxicology Quality Manual: Class II Nonconforming Work

15.2.2 Discussion

Trainee Initials	Trainer Initials	Date	Discuss the Following:
			Routing options
			Technical review requirements

15.2.3 Observation

Trainee Initials	Trainer Initials	Date	Observe the Following:
			Analyst complete technical reviews on each case type if possible

15.2.4 Laboratory Exercise (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the Following:
			Review 50 cases

15.2.5 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

15.3 Reflection Questions

15.3.1 What are the different routing options and when would they be used?

15.3.2 What steps need to be taken after a class II has been identified?

15.3.3 What should be done if a change is made after a report is signed, but before the report has been approved?

15.4 Comments

Review 50 Cases: The trainee will perform technical reviews on at least 50 cases. The cases will then be reviewed by a qualified reviewer. There must be no significant errors identified in the trainee's reviews. The cases will be routed to the trainee using the route for training purposes code (RTP) with the name of the qualified criminalist it should be routed to once it has been reviewed by the trainee. Once the trainee has completed the review, their comments will be recorded in an Excel sheet with the case numbers (these comments can include, but are not limited to, ready for approval, question comment, correction, class II). If any comment besides "ready for approval" or similar wording, is used, additional information will need to be included in the Excel sheet. The Excel sheet will be maintained with the trainee's training manual. The case will then be routed to a qualified criminalist. The FTU Technical Manager or trainer will then compare the trainee's notes with the results of the review from the qualified reviewer. Any discrepancies will be discussed with the trainee. Additional reviews may be assigned at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to review additional cases if desired. If the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete the laboratory exercise for this module.

MODULE 16. LABORATORY TECHNICIAN

16.1 Minimum Requirements for Orientation

16.1.1 Overview of:

16.1.1.1 Toxicology Training Manual

16.1.1.2 Toxicology Quality Manual

16.1.1.3 Criminalistics Services Division (CSD) Quality Manual

16.1.1.4 Evidence Management

16.1.2 Introduction to the technical capabilities of the Forensic Toxicology Laboratory

16.1.3 Explanation of the purpose of the training program including an insight into the course of events and what the trainee is expected to accomplish

16.1.4 Introduction to the LIMS system

16.1.5 Understand evidence handling procedures used by CSD as detailed in the CSD Quality Manual

16.1.6 Understand evidence handling procedures pertinent to the Forensic Toxicology Unit

16.1.7 Understand the importance of safety regarding the handling of biological evidence

16.1.8 Receive and inventory OSBI blood specimen collection kits

Estimated Time for Completion: **Six Months** **Trainer Initials:** _____ **Date of Completion:** _____

16.2 Methods of Instruction

16.2.1 Literature review

Trainee Initials	Date	Review the following:
		CSD Quality Manual and Procedures
		CSD Quality Manual QMA 2: Evidence Acceptance Requirements
		CSD Quality Manual QMA 3: Evidence Packaging and Sealing Requirements
		CSD Quality Manual QP 5: Evidence Intake
		CSD Quality Manual QP 6: Evidence Handling (6.1, 6.3.II.E, 6.3.II.F, 6.4)
		CSD Quality Manual QP 7: Evidence Transactions
		Toxicology Quality Manual: Sample Handling and Storage
		§47-752. Procedure for Blood Tests – Authorization – Liability for Withdrawal – Reports https://www.oscn.net/v4/
		CSD Quality Manual QP 16.1: Control of Records
		CSD Quality Manual QP 16.2: Contents of Case Records

		§74-150.5. Investigations – Who May Initiate Investigation by Request – Confidentiality of Records

16.2.2 Discussion

Trainee Initials	Trainer Initials	Date	Discuss the Following:
			When information can be released
			Who can receive released information
			What can be discussed over the phone
			What will be logged as a narrative
			Tracking changes

16.2.3 Observations

Trainee Initials	Trainer Initials	Date	Observe the following:
			A minimum of two different analysts receive and inventory approximately 63 cases of evidence
			An evidence technician complete the evidence intake process for at least one blood kit
			The secure storage of evidence before, during, and after analysis
			The proper use of chain of custody (obtain a personal barcode)
			Use of the LIMS system to create worklists for TX04 and TX05
			Performance of a custody inquiry
			Labeling of glassware for TX04 and TX05
			Creating a narrative
			Reagent and standard preparation
			Instrument maintenance (* maintenance only)
			Preparing a sample to be sent out for independent analysis

16.2.4 Laboratory Exercises (see end of module)

Trainee Initials	Trainer Initials	Date	Complete the following:
			Inventory approximately 42 cases
			Create worklists and label glassware as needed for laboratory staff
			Pipetting exercise

16.2.5 Evaluation

An evaluation will be performed to verify the learning objectives were met. This may be completed by any of the following method(s): a written examination, observation, practice exercise(s), an oral examination, standardized questions with expected answers, or by completion of a competency test.

16.2.6 Competency

A competency will be given to show the trainee's competence of inventorying blood alcohol kits. The FTU Technical Manager will randomly select ten cases from the 21 unsupervised exercise cases to evaluate for the competency test. A satisfactory competency test will be a 90% based on the kit inventory grading rubric.

If Artel is used for the pipetting exercise, the results of the three pipettes used with the Artel system will constitute a competency test for the use of the Artel system. A satisfactory result will be a result within ±10% of the known volume. If the results are not within 10%, the pipette will be verified by the trainer using the balance. If the results are within ±10% of the known volume, the competency will be repeated. If the results are not within ±10% of the known volume when tested by the trainer, a different pipette with the same known volume will be checked by the trainer as mentioned above. Once an acceptable pipette has been located, the competency will be repeated.

16.3 Reflection Questions

16.3.1 What does the OSBI CSD Forensic Toxicology Laboratory do with the biological specimens after receiving them to preserve their condition?

16.3.2 How is DUI/DUID evidence typically submitted?

16.3.3 Whenever toxicology evidence is not actively being analyzed, where should it be stored?

16.3.4 Who are we allowed to discuss case information with outside the OSBI?

16.3.5 When should a narrative be created and what type of contact should be logged this way?

16.4 Comments

Inventory Approximately 42 Cases: If previously analyzed case samples are used, they shall not be cases currently in process or currently in the four-month holding process. Cases may also be mock samples. At a minimum, the first 21 cases will be inventoried under direct supervision of qualified laboratory personnel. If not directly supervised for the remaining cases, then the trainer will verify all cases were inventoried correctly. Additional samples may be pulled /created at the discretion of the FTU Technical Manager and/or trainer to ensure the trainee is not deficient in this exercise. The trainee may also request to inventory additional cases if desired. If the trainee appears deficient, this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises.

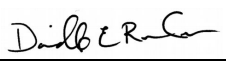
Create Worklists and Label Glassware: Create worklists and label glassware for at least one criminalist. For TX05, position numbers should be on the worklist. TX05 glassware should have both the position number and laboratory case number. All other glassware should have the laboratory case number.

Pipetting Exercise: Place a weigh-boat on the balance and tare the balance. Using a pipette, weigh out a known volume (10, 20, 25, 50, 100, 200, 250, 500, and 1000 µL) of deionized water and record the weight of the water using the appropriate number of significant figures. Perform each volume-weight measurement three (3) separate times, recording the weights; in doing so, record weight 1 first for all increasing volumes, then repeat and record weight 2 and finally, weight 3. Then determine the mean weight for each volume. Results of the exercise must be within ±10% of the known volume. If the results are not within ±10%, then the exercise will be repeated until the trainee can satisfactorily complete the exercise. This exercise can be completed on the Artel system for three of the pipette volumes if all necessary reagents are available. If completed using the Artel system, the trainee will observe the process of verifying a pipette using the Artel system prior to beginning the pipetting exercise. The balance should be used for the remaining volumes. If the Artel system is used, the trainer will review the results. If the results are satisfactory as listed above, the trainee will be considered competent in the use of the Artel system for pipette verification checks.

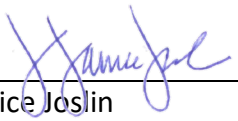
Observed Date	Trainer Initials	Performed Date	Trainer Initials	Routine Maintenance
				Rubber Septa Change (if applicable)*
				Monthly ELISA Rinse (if applicable)*
				Liner Replacement *
				Filling Wash Vials*
				Replace Gold Seal
				Trim Column
				Replace Column
				Replace Syringe
				Replace Microseal
				Hydrocarbon Ladder*
				Change Pump Oil (if applicable)*
				Clean Source/Change Filament
				Hydrogen Generator Deionizer Bag Change*
				Weekly Ballasting Procedure (LC)*
				Weekly Isopropanol Rinse (LC)*
				Purge (LC)*
				Refill Hydrogen Generator*
				Autotune/Tune Evaluation (GC/MS)*
				DL replacement (LC)
				GC/MS Pump replacement
				Change Guard (LC)
				Clean Housing (LC)*
				Capillary replacement (LC)
				Needle replacement (LC)
				PEEK tubing replacement (LC)
				Change column (LC)
				Sample loop change (LC)
				Autotune (LC)
				Cleaning optics (LC)

Observed Date	Trainer Initials	Performed Date	Trainer Initials	Reagent/Standard
				N-propanol Internal Standard
				Multicomponent Volatile Mix Solution
				Chloroform Positive Control
				Toluene Positive Control
				DFE Positive Control
				ELISA Positive Controls (Low and High)
				TX01 Internal Standard (NPA:SKF)
				TX01 Positive Control
				TX09 Internal Standard (Hexobarbital)
				TX09 Positive Control
				n-hexanes Saturated with Acetonitrile
				Hydrocarbon Ladder
				1:1 Hexanes:Ethyl Acetate
				TX36 Internal Standard
				TX36 Working Solutions (A&B)
				TX36 Positive Control
				TX14 Reconstitution Solution 1:1 DI Water:Acetonitrile
				9:1 Hexanes:Ethyl Acetate
				10% Acetic Acid
				TX14 Working Solutions (A&B)
				TX14 Internal Standard
				TX34, TX39 Reconstitution Solution 9:1 DI Water:Acetonitrile
				TX34 Internal Standard
				TX34 Working Positive Controls (Low&High)
				TX38 Reconstitution Solution 1:3 DI Water:Acetonitrile
				TX38 Internal Standard
				TX38 Working Solutions (Low&High)
				TX39 Internal Standard
				TX39 Working Solutions (Low&High)
				TX40 Internal Standard
				TX40 Working Solutions (Low&High)
				TX41 Internal Standard (does not need to be for all drugs in method)
				TX41 Working Solution (does not need to be for all drugs in method) (A&B)
				TX41 Positive Control Standard (does not need to be for all drugs in method)
				Mobile Phase Preparation (if necessary)
				LC Rinse
				TX42 Elution Solvent
				TX42 Internal Standard
				TX42 Positive Controls (Low&High)

APPROVAL

FTU Technical Manager  Date: 05/24/24

Danielle Ross-Carr

CSD Director  Date: 05/24/2024

Janice Joslin

DOCUMENT HISTORY

Issue Date	Revision No.	Revised By	Document History
03/29/11	1	K. Cliburn	Complete rewrite
12/31/2011	2	K. Cliburn	Added information regarding laboratory technician training. Changed TM06 form.
06/30/12	3	K. Cliburn	Included competency test and criteria in Section 15. Included meeting with QM for Section 12. Created Section 8. LC/MS/MS
12/31/12	4	D. Jeffries	None
04/22/13	5	M. Stillwell	Complete rewrite.
12/31/13	6	M. Stillwell	Added "review measurement of uncertainty" in the volatile screen.
12/31/14	7	M. Stillwell	Added a line for signing off when a module is complete and revised the mock trial review form.
12/31/15	8	M. Stillwell	Formatted the Headers, improved headings for Application of ethical practices in forensic sciences, General knowledge of forensic science, Applicable criminal and civil law and procedures, Overview of quality system, Applicable Safety Topics (blood borne pathogens, chemical hygiene, etc.).
01/01/17	8	M. Stillwell	Reviewed, no changes.
12/31/17	9	M. Stillwell	Reviewed, corrected numbering.
07/01/18	10	M. Brous	Added module over uncertainty and readjusted the numbers, added evaluation and competency in some modules, adding presentation to module 10, added exercises to module 3, changed number of practice items in modules, fixed formatting issues, added oral

			examination, added additional reading, added re-training section, added QP 19 reference.
08/2/19	11	D. Ross-Carr	Re-formatted. Re-ordered modules. Created modules for LC/MS-MS quantitation and laboratory technician training. Separated out blood alcohol and volatile analysis. Added competency for inventorying kits. Added reflection questions to each module. Added additional exercise for blood alcohol.
12/31/20	12	D. Ross-Carr	Updated beginning sections to account for new employee general training manual including titles to match the general training manual and removal of all repeat information. Clarification of 3.3.2. Addition of uncertainty of measurement courses to module 5 pending funding. Addition of the statement "if the trainee appears deficient, then this module will be repeated in part or in full. A trainee may be considered deficient if they are unable to successfully complete all laboratory exercises and a competency test for this module" to module 10. Add TX14 to module 11 and remove from module 12 and clarified the lab exercise. Removed redundancies in the description of laboratory exercises in module 11. Fixed typos throughout document. Switched SWGTOX document for method validation to ANSI/ASB document for method validation. Corrected mock trial score range from 0-4 to 0-3 to match attached assessment document in 14.2.6. Clarified when competency testing would be assigned in 15.2.1. Additional of "Preparing a sample to be sent out for independent analysis" to observation sections in modules 2 and 17. Removal of "At least one case should be a mock DFSA case" from inventory exercise in module 17. Addition of reagent preparation and instrument maintenance (* only) to module 17. Added DL replacement and GC/MS pump replacement to the maintenance list and LC rinse to the reagent list.
3/15/21	13	Ross-Carr	None
11/5/21	14	D. Ross-Carr	Updated technician module to include preparation of standards. Changed analyst to criminalist in re-training section. Updated law titles and web addresses.

			Added change guard and clean housing to maintenance list. Adjusted to gender neutral language. Added Artel training and competency test to Module 2 and Module 17. Update page numbers for 5th edition Principles of Forensic Toxicology. Added allowance for the use of previously analyzed samples in module 3. Various grammar corrections. Added measurement uncertainty reading from Principles of Forensic Toxicology to module 5. Added miscellaneous central nervous system depressants reading from Principles of Forensic Toxicology to module 8. Added quantitative analytical methods reading from Principles of Forensic Toxicology to module 10. Corrected QP titles in Module 16. Updated headers to match modules.
06/06/22	15	D. Ross-Carr	Included deviations. Combined Modules for TX06 and TX07 (4 and 6) into module 4 for TX43. Corrected all numbering after removal of Module 6. Corrected references to modules throughout based on new numbering.
10/01/23	16	D. Ross-Carr	Fix grammar and punctuation. Moved module 4 – Volatile Analysis to Module 11. Corrected numbers. Changed “Forensic Toxicology Unit” to FTU after acronym was introduced. Added “see end of module” to laboratory exercise titles for clarification. Corrected “Toxicology Quality Manual: Ensuring the Validity of Results” in module 9 reading. Also added to acceptance criteria for module 11 mock cases. Changed “analysis method” to “analysis type” in 14.3 for better clarity regarding required CTs. Added “or similar wording” to TR laboratory exercise to allow for wording most comfortable to criminalist to describe a report being ready for approval. Changed “analyst” to “criminalist” when technicians could not also complete the task.

			Added to maintenance: Capillary replacement (LC) Needle replacement (LC) PEEK tubing replacement (LC) Change column (LC) Sample loop change (LC) Autotune (LC) Cleaning optics (LC) Added to reagents and standards: TX42 Elution Solvent TX42 Internal Standard TX42 Positive Controls (Low&High) Updated mock trial evaluation form to better cover information being reviewed during a mock trial. CSU mock trial evaluation form used for reference when updating document.
06/01/24	17	D. Ross-Carr	Fix grammar and punctuation. Updated link to SOFT Ethics Procedures and OSBI website.

APPENDIX

Mock Trial Assessment

Trainee: _____ Date: _____

Evaluator: _____ Score: _____

	Excellent (3)	Good (2)	Fair (1)	Poor (0)
Voice Modulation and verbal pauses				
Demeanor and appearance				
Ability to convey information in an understandable manner				
Poised and professional during direct examination				
Poised and professional during cross examination				
Testimony based upon scientific principles				
Exhibition of knowledge of OSBI testing procedures				
Explanation of results				

An average score of 2 with no individual ratings of 0 required to successfully pass mock trial

Remarks/comments/Suggestions (please explain a poor rating)

_____

_____

_____

_____

_____

_____