

A. Purpose: Outline the following training procedure for all persons newly assigned to Instrumentation Section who are conducting examinations of Gunshot Residue (GSR). The amount of time necessary to achieve proficiency in any area may be affected by the previous experience and training of the individual examiner.

B. Responsibility: GSR analyst or designee

Procedure:

I. Introduction

Complete Initials Date

Goals:

Upon complete the examiner will be familiar with the forensic laboratory operation, LIMS system and individual responsibilities.

Tasks:

- ___ -Orientation to the laboratory facility and personnel
- ___ -Instruction of the organization structure, code of ethics and chain of command
- ___ -Security and confidentiality requirements
- ___ -Introduction to quality control and quality assurance including required documentation
- ___ -Safety procedures: Chemical and biohazard, incident reports, fire/emergency procedures

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Reading:

- ___ -Laboratory Quality Manual (given own copy)
- ___ -DPS A&O manual (given own copy)
- ___ -Emergency and Safety Manuals (given own copy)
- ___ -Section QA/QC procedures (in section)

Assessment:

- ___ -Oral and/or written evaluation by QC manager and supervisors
- ___ -Signed receipts

II. Evidence Handling

Goals:

- ___ -To handle evidence in a manner appropriate for the Instrumentation Section with respect to GSR, and to preserve evidence which may be analyzed by other sections of the lab.
- ___ -To learn the operation of the LIMS system, item assignment, and the maintenance of chain of evidence for submissions and items.
- ___ -To demonstrate proficiency in the basic tasks necessary to complete evidence transfer functions and create a chain of evidence

Tasks:

- ___ -Demonstrate the ability to document and analyze GSR evidence
 - a. Documentation of GSR evidence
 - b. Sample handling
 - c. Contamination issues related to GSR evidence
 - d. Packaging
 - e. Extraction and analysis of GSR evidence

Reading:

- ___ -Quality Manual
- ___ -LIMS training manual
- ___ -Section procedures

Assessment:

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_____ -By supervisor, evidence receiving supervisor

III. Foundational Scientific Knowledge

Goal:

_____ -To assure examiners have both the formal education and working knowledge of the fundamental basis and formation of gunshot residue, analysis of its evidence and interpretation of results.

Tasks:

- List of knowledge for the following areas:
 - a. Structure of firearms and ammunition
 - b. Chemical composition of ammunition
 - c. Formation of gunshot residue
 - d. Principles of SEM/EDS and ICP (inductively coupled plasma)
 - e. Theories of persistence of GSR
 - f. Attendance at specialized schools

Reading:

- _____ -FBI: "Summary of the FBI Laboratory's Gunshot Residue Symposium"
- _____ -Deforest, Gaensslen, and Lee: "Forensic Science: An Introduction to Criminalistics". McGraw-Hill, Inc. 1983
- _____ -Saferstien, Richard (ed.) Forensic Science Handbook. Prentice-Hall Inc. Englewood Cliffs, New Jersey (1982)

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___ -Terminology

Assessments:

___ -Completed by the supervisor

___ -List and document the review of the educational guideline/requirements

IV. Applied Technical Knowledge

Goals:

___ ___ -To demonstrate specific knowledge related to the field of gunshot residue

Tasks:

___ -To provide instruction on the theory and legal challenges to the following:

- a. Structure of different weapons and ammunition
- b. Collection of GSR evidence
- c. Preparation and examination of GSR kits by ICP
- d. Significance of GSR results
- e. Persistence of GSR on individuals and objects
- f. Sample handling
- g. GSR analysis

Assessment:

-Documentation of successful completion of each task by written &/or oral examination

___ -Notation on checklist/memo that applied scientific knowledge has been achieved

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V. Laboratory Analytical Procedures

Goals:

- ___ -To provide instruction to examiner on analytical procedures carried out as routine tests by person in the job description of the examiner

Tasks:

- ___ - To provide instruction and training in the following technical procedures
 - Use of iCP
 - Identification of gunpowder-morphological characteristics and solubility tests
 - Evaluation of GSR evidence
 - Documentation of evidence
 - Recognition and recovery of GSR on evidence

Reading:

- Section Technical Procedure
- ___ - Corresponding journal articles relating to specific procedure as applicable

Assessment:

- ___ - Evaluation of each procedure in the hands of the examiner by the section lead

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- ___ - Examination for approximately 20 cases should be performed under a close supervision
- ___ - Proficiency test completion for each type of examination, includes samples which correspond to a mock case, as compiled by the section lead
- ___ - Documentation of the readiness for casework by the section lead in the form of memo (see Quality Manual)

VI. Report Writing

Goals:

- ___ ___ ___ -To learn the laboratory protocol for report writing and review, including LIMS procedures

Tasks:

- ___ ___ ___ -Laboratory interpretation guidelines for the section

Reading:

- ___ -Review of reports with case jackets relating to various types of cases and scenarios as determined by the section lead.

Assessment:

- ___ -Sample data/results given to the examiner to interpret and write a repmi
- ___ -Demonstrate proficiency in all necessary LIMS areas
- ___ -Complete written report of proficiency test results
- ___ -Documentation of these processes by the section lead

VII. Legal Issues

Goals:

___ -To become familiar with the legal requirements for testimony in Connecticut

Task:

___ -Examiner will receive instruction on the requirements and testimony related to:

- a. Qualification
- b. Technical testimony as related to GSR examinations
- c. Courtroom dress and demeanor
- d. Ethical responsibilities of expert witnesses
- e. Laboratory courtroom monitoring procedures and reports
- f. Presentation of evidence
- g. Pertinent rules of the courtroom

Reading:

- ___ -Court transcripts or sample testimony
- ___ -State admissibility requirements (State v. Porter)
- ___ -Admissibility, in general-Frye, Daubert, etc.

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___ -QA/QC Manual

Assessment:

- ___ -Oral or written questions by the section lead. Each examiner who is new to the lab or to the new area shall demonstrate expertise by moot court
- Documentation of the moot court should contain an evaluation in memo form of the examiner's responses and demeanor

Approved by Director: Dr. Guy Vallaro

D. Bibliography

- ASTM "Standard Guide for Gunshot Analysis by Scanning Electron Microscopy/Energy Dispersive Spectroscopy" Designation: E 1588-94
- "Final Report on Particle Analysis for Gunshot Residue Detection" Aerospace Report No Atr-77(7915)-3d
- The Particle Atlas Vol.3. 2nd Ed. Panicle No.512 P.758 Ann Arbor Science Publishers 1973 by W.C McCrone and J.G. Deily
- Forensic Science Handbook. Volume II. By Saferstein (selected topics)
- Instrumental Method of Analysis. ih Ed. Chapters 13 "X-ray" Methods by Willard. McNitt, Dean and Settle
- Forensic Science An Introduction to Criminalistics Chapter 14 "Toolmarks and Firearms" by Deforest, Gaensslen, and Lee
- Scanning Electron Microscopy: Applications to Materials and Device Science; Chapter #1, by P.R. Thomson

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Documents outside of Qualtrax are considered uncontrolled.

- The Scanning Electron Microscope: part 1. The Instrument: by C. W. Oatley, F.R.S.
- "Gunshot Residue Analysis-A Review", JFS 1997; 42(4):553-570 by Meng, HH et.al.
- "Survey of Gunshot Residue Analysis in Forensic Science Laboratories" JFS 1990; 35(5): 1087-1095 by DeGaetano, D. et. al.
- "Evaluation of Instrumental Parameters for Automated Scanning Electron Microscopy/Gunshot Residue Particle Analysis" JFS 1991; 36(2):331-342 by Germani, M.S.
- "Semi-Automatic Detection of Gunshot Residue (GSR) by Scanning Electron Microscopy and Energy Dispersive X-Ray Analysis (SEM/EDX)" Scanning Electron Microscopy 1982; 1:107-114 by Gansau and Becker
- "A field kit for sampling Gunshot Residue Particles" JFS 1982;27(3):671-676 by Tassa. M. et.al
- "Fundamental Studies of Gunshot Residue Deposition" JFS 1997; 42(4): 571-581 by Basu, S. et.al.

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