

# Scientific Working Group on Bloodstain Pattern Analysis: Guidelines for Proficiency Testing in Bloodstain Pattern Analysis

## Scientific Working Group on Bloodstain Pattern Analysis (SWGSTAIN)

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### Objective

This document provides guidelines for the establishment of a bloodstain pattern analysis (BPA) proficiency testing program within an agency. In addition, guidance is also provided for test development and evaluation. Proficiency testing is a component of a quality assurance program that is intended to assess the skills of a bloodstain pattern analyst, ensure competence in the area(s) tested is maintained, and ensure that the agency's technical procedures are valid and fit for purpose. Undertaking proficiency testing may identify areas where improvements are required and where corrective actions may be appropriate.

**Proficiency testing must not be considered a replacement for training or continuing education.**

### Introduction

The Scientific Working Group on Bloodstain Pattern Analysis (SWGSTAIN) comprises recognized bloodstain pattern analysis experts from North America, Europe, New Zealand, and Australia. The objective of SWGSTAIN is to serve as a professional forum in which BPA practitioners and practitioners from related fields discuss and evaluate methods, techniques, protocols, quality assurance, education, and research relating to BPA. SWGSTAIN's ultimate goal is to use these professional exchanges to address substantive and operational issues within the field of BPA and to work to build consensus-based "best practice" guidelines for the enhancement of the discipline of BPA.

## **Statement of Purpose**

The purpose of this document is to provide a guide for proficiency testing. This document provides guidance to test developers and participants, taking into consideration such aspects as test format and design, test validation, test administration, and evaluation of results.

## **Definitions**

As used by SWGSTAIN, the following terms are meant to convey the meanings specified:

Must – Done without exception

Should – Expected to be done

Recommended – Appropriate, but not mandatory

## **1. Scope**

- 1.1 The intent of a proficiency test program is to evaluate an individual analyst's continued competency and adherence to one's agency's procedures.
- 1.2 Only analysts who have been trained to competency should be proficiency tested.

## **2. Program Planning**

When establishing a proficiency test program, an agency should design a plan which details the components and extent of the program. The following should be taken into consideration.

- 2.1 Who is to be tested

The agency should define who is to be tested and ensure testing is at an appropriate level for the function of the analyst. Factors to consider include but are not limited to:

- Accreditation standards
- Certification requirements

## 2.2 The knowledge, skills, and abilities to be tested

The proficiency test should reflect the knowledge, skills, and abilities necessary to fulfill the requirements of the analyst's job in relation to BPA.

These areas may include but are not limited to:

- Pattern recognition
- Angle of impact determination
- Area of convergence and origin determination
- Clothing examination
- Possible mechanism determination
- Stain selection and sampling for biological analysis
- Evidence integrity
- Photography
- Analysis and Reporting
- Chemical enhancement
- Presumptive testing

In addition to these areas, it is recommended the agency evaluate adherence to agency procedures relating to documentation, technical review, evidence handling, and related administrative actions.

## 2.3 Test format

The agency should establish the format(s) of the proficiency tests to be administered. Types of administration formats include:

2.3.1 OPEN - In open testing, the bloodstain pattern analyst is aware they are being tested.

2.3.2 BLIND - In blind testing, the bloodstain pattern analyst is not aware they are being tested.

## 2.4 Test administration

2.4.1 The agency should take into consideration the proficiency test designer's training, experience, and qualifications, the test design

and complexity, and the relevance to the agency's and analyst's capabilities when choosing a proficiency test provider.

2.4.2 The agency should make every effort to avoid redundancy of the subject matter being tested in consecutive tests.

2.4.3 The agency should ensure analysts apply established procedures while performing the analysis and independent conclusions are produced as appropriate to a test's purposes. If the purpose of the test includes testing agency procedures, then technical review would be appropriate.

2.4.4 Consideration should be taken to establish the maximum time intervals between tests in which the analyst's knowledge, skills, and abilities, as outlined in section 2.2, are tested. It is recommended proficiency testing be conducted on an annual basis for each qualified analyst.

2.4.5 Proctoring of tests is not required.

### **3. Design**

3.1 Test design – When designing a BPA proficiency test, the following should be considered:

3.1.1 A bloodstain pattern analyst should be involved in the design and construction of BPA proficiency tests.

3.1.2 The proficiency test should mimic actual casework as closely as possible. Patterns should be created using mechanisms that are encountered in casework. Factors to consider when designing the test include, but are not limited to:

- Predetermined scenario
- Stain pattern location and contextual information

3.1.3 Supporting information should be provided to the participant which includes but is not limited to:

- Scenario information
- Stain pattern location and contextual information
- Medical information
- Blood source information (e.g., DNA information)
- Source of the evidence item(s)
- Additional photographs
- Supplementary information (e.g., history of the item, police reports, and other statements)

3.1.4 The designer must document the proficiency test design and construction.

3.2 Test Validation - The ability of a proficiency test to reliably assess the bloodstain pattern analyst's performance must be validated prior to distribution.

3.2.1 Proficiency tests offered by a commercial test provider should be validated by pre-distribution to three or more bloodstain pattern analysts, preferably from different agencies.

3.2.2 There is no requirement for third party validation of internal or interagency proficiency tests. Internal validation will be achieved through documentation of the construction and design of the test.

## **4. Evaluation**

4.1 Results evaluation - The agency should identify a bloodstain pattern analyst(s), who is actively engaged in the field, to evaluate the proficiency test results. If an evaluator is not available within the agency, it is

recommended an agreement is entered into with another agency for evaluation.

4.1.1 The evaluator(s) should take into consideration the following:

- The design and construction of the test
- The expected results as determined by the evaluator
- The consensus results
- The expected results as supplied by the provider

4.1.2 If an inconsistency is identified then the evaluator(s) must determine the level of the inconsistency. The agency should have criteria in place for the categorization of the levels of inconsistency based on the inconsistency's effect on the quality of the work product.

An example of the levels of inconsistencies may be categorized as follows:

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|-----------|--|
| Class I   | The nature and cause of the inconsistency raises immediate concern regarding the quality of the agency's work product (e.g., a bloodstain pattern misidentification).  |
| Class II  | The inconsistency is due to a problem which may affect the quality of the work, but is not serious enough to cause immediate concern for the overall quality of the agency's work product (e.g., one outlying angle of impact measurement from a group of measurements). |
| Class III | The inconsistency is determined to have only minimal effect or significance, be unlikely to recur, is not systemic, and does not significantly affect the fundamental reliability of the agency's work product (e.g., a clerical or administrative error).               |

The above classes have been adapted from *The American Society of Crime Laboratory Directors Laboratory Accreditation Board (ASCLD/LAB) Proficiency Review Program, 2008*.<sup>1</sup>

#### 4.2 Test feedback

The agency should have in place a procedure which ensures the outcome of the proficiency test is conveyed to the participant and any other relevant individuals.

#### 4.3 Corrective action

The agency must have corrective action procedures in place that are appropriate for the levels of inconsistencies categorized above. For example:

A Class I inconsistency may involve the removal of the analyst from casework, review of the analyst's case files, and the successful completion of a competency test;

A Class II inconsistency may involve remedial training;

A Class III inconsistency may involve reiteration of the agency's administrative procedures with the analyst.

### 5. Documentation

The agency must have procedures in place to retain **all** documentation related to the proficiency test. The retention period should be specified by the agency.

### 6. Glossary

*Agency* - Any entity—such as an individual, a law enforcement department, a private company, or a government or private laboratory—that provides BPA as one of its functions.

*Bloodstain pattern analyst* – as defined through the Scientific Working Group on Bloodstain Pattern Analysis: Guidelines for the Minimum Educational and Training Requirements for Bloodstain Pattern Analysts

## 7. References

<sup>1</sup>The ASCLD/LAB Proficiency Review Program, 2008. <http://www.ascl-lab.org/documents/alpd1002.pdf> (date accessed: 14 April 2010).