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Standard for the Development of a Bloodstain Pattern Analyst Certification Program

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410 North 21st Street
Colorado Springs, CO 80904

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Foreword

A bloodstain pattern analyst certification program is a way to improve the competency, reliability, and quality of the work product of a bloodstain pattern analyst. This document provides guidance in the preparation and participation in a certification program for the discipline of bloodstain pattern analysis (BPA) and for bodies providing certification examination programs.

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This document was revised, prepared, and finalized as a standard by the Bloodstain Pattern Analysis Consensus Body of the AAFS Standards Board. The draft of this standard was developed by the Bloodstain Pattern Analysis Subcommittee of the Organization of Scientific Area Committees (OSAC) for Forensic Science.

Questions, comments, and suggestions for the improvement of this document can be sent to AAFS-ASB Secretariat, asb@aafs.org or 410 N 21st Street, Colorado Springs, CO 80904.

All hyperlinks and web addresses shown in this document are current as of the publication date of this standard.

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Keywords: *bloodstain pattern analysis, certification, examination*

Table of Contents

Standard for the Development of a Bloodstain Pattern Analyst Certification Program

1 Scope

This document establishes the requirements for the development of a bloodstain pattern analyst (BPA) certification program by certification providers.

2 Normative References

For dated references, only the cited edition applies. For undated references, the latest edition including amendments applies.

ANSI/ASB Standard 032, *Standards for a Bloodstain Pattern Analyst's Training Program*, 1st Edition, 2020[a]

ASTM E2917-19a, *Standard Practice for Forensic Science Practitioner Training, Continuing Education, and Professional Development Programs*[b]

ISO/IEC 17024:2012, *Conformity assessment — General requirements for bodies operating certification of persons*[c]

3 Terms and Definitions

For purposes of this document, the following definitions apply.

3.1
applicant
Person who has submitted an application for admission into the certification process.

3.2
assessment
Process that evaluates a person's fulfillment of the requirements of the certification scheme.

3.3
bloodstain pattern analyst
BPA
An individual who has successfully completed a bloodstain pattern analyst training program.

3.4
candidate
Applicant who has fulfilled specified prerequisites and has been admitted to the certification process.

[a] Available from: https://www.aafs.org/academy-standards-board
[b] Available from: https://www.astm.org/e2917-19a.html
[c] Available from: https://www.iso.org/standard/52993.html

3.5
certification
The recognition by an independent certification body that an individual has acquired and demonstrated specialized knowledge, skills, and abilities in the standard practices necessary to execute the duties of his or her profession.

3.6
certification process
Activities by which the certification provider determines that a person fulfills certification requirements, including application, assessment, and certification, recertification.

3.7
certification scheme
Competence and other requirements related to specific occupational or skilled categories of persons.

3.8
competency
Demonstration that a forensic science practitioner has acquired and demonstrated specialized knowledge, skills, and abilities in the standard practices necessary to conduct examinations in a discipline or category of testing prior to performing independent casework.

3.9
examination
Mechanism that is part of the assessment which measures a candidate's competence by one or more means, such as written, oral, practical, and observational, as defined in the certification scheme.

3.10
proctor
Person, authorized by the certification provider, who administers or supervises a certification test, but does not evaluate the competency of the candidate.

4 Job and Task Description

Bloodstain pattern analysis involves documentation, evaluation, and analysis of bloodstain patterns; specifically, the size, shape, distribution, appearance, and location of the bloodstains, as well as the surfaces upon which the blood was deposited. The bloodstain pattern analyst uses their knowledge, skills, training, and experience to evaluate the bloodstain(s) and relevant case evidence through application of the scientific method. Interpretations and opinions generated as a result of the analysis are communicated through reporting and testimony.

5 Application and Administration

5.1 General

5.1.1 Application and administration of the certification program shall be the responsibility of the certification provider.

5.1.2 Administration of the process shall be governed and conducted by a body or organization accredited to International Organization for Standardization (ISO) 17024, *Conformity assessment — General requirements for bodies operating certification of persons*.

5.2 Application Process

5.2.1 The applicant shall file an application in accordance with the certification examination provider's requirements.

5.2.2 The applicant shall provide documentation of the applicant's training program. The certification provider may establish its assessment criteria using standards such as ASTM E2917-19a *Standard Practice for Forensic Science Practitioner Training, Continuing Education, and Professional Development Programs* and ANSI/ASB Standard 032, *Standards for a Bloodstain Pattern Analyst's Training Program*, 1st Ed. 2020.

5.3 Examination Process

5.3.1 The certification examination shall consist of four proctored components developed by bloodstain pattern analysts in consultation with experts in standardized testing.

5.3.1.1 Proctor shall be approved and designated by the certification provider.

5.3.1.2 Candidate shall have eight (8) hours to complete the four components of the examination as outlined in 5.3.1.2.1 through 5.3.1.2.4.

5.3.1.2.1 *Pattern Classification*: classify a minimum of twenty (20) provider created bloodstain patterns representative of the full range of patterns that may be encountered in case work, in terms of complexity and difficulty.

5.3.1.2.2 *Area of Convergence and Area of Origin Exercise*: a minimum of 1 (one) area of convergence and area of origin determination of a bloodstain pattern created by the provider.

5.3.1.2.3 *Analytical Exercise*: a section to test the candidate's analytical abilities regarding BPA principles where the candidate is provided bloodstain photographs and investigative questions representative of the full range of patterns that may be encountered in case work, in terms of complexity and difficulty. There shall be a minimum of ten (10) scenarios.

5.3.1.2.4 *Written Examination*: consisting of a minimum of 150 multiple choice and true-false questions. The written examination shall include the following topic areas.

a) Physical properties of blood:

    1) viscosity;

    2) surface tension;

    3) adhesive properties;

    4) cohesive properties;

    5) capillary action;

6) Newtonian and non-Newtonian fluids.

b) Composition and function of blood:

1) erythrocytes;

2) leukocytes.;

3) thrombocytes;

4) plasma;

5) clotting of blood;

6) drying of blood.

c) Physics:

1) Newton's laws of motion;

2) gravity;

3) air resistance – drag;

4) shear force;

5) factors affecting blood in motion:

— oscillation,

— gravity,

— air resistance;

6) velocity;

7) characteristics of blood in motion;

8) target surface effects.

d) Documentation:

1) notes;

2) use of scale and unique identifiers;

3) sketching;

4) road mapping;

5) photography:

- overall,
- mid-range,
- close-up.

e) External Forces/Environment:

1) air movement;
2) humidity;
3) temperature.

f) Determining Area of Origin:

1) area of convergence;
2) trigonometry:
   - mathematical equations.

g) Wound Dynamics:

1) blunt force trauma;
2) sharp force wounds:
   - stab wounds,
   - incised wounds;
3) gunshot;
4) role of the forensic pathologist:
   - external injuries,
   - internal injuries.

h) Bloodstain Evidence:

1) standards of evidence;
2) safety and PPE considerations;
3) presumptive testing and enhancement techniques:
   - methods of presumptive blood testing,
   - detection,

- enhancement,
- chemical processing,
- alternate light source,
- documentation of testing;

4) collection of biological fluids:

- serological and DNA considerations.

i) Bloodstained Clothing and Fabrics:

1) fabric composition and construction;
2) natural and synthetic;
3) dyes;
4) treatment;
5) condition – new/old clothing.

j) Bloodstain Patterns:

1) characteristics;
2) pattern classification;
3) overlapping patterns;
4) terminology;
5) limitations of bloodstain pattern analysis.

k) History:

1) contributors to BPA:

- Piotrowski,
- Balthazard,
- Paul Kirk;

2) notable cases to the bloodstain pattern analysis community.

l) Bias in BPA:

1) contextual bias;

2) confirmation bias;

3) motivational bias ;

4) expectation bias.

m) Ethics:

1) disclosure of exculpatory material to counsel;

2) working within professional competence;

3) providing clear and objective testimony;

4) avoiding conflicts of interest.

5.3.2 Assessment scoring shall adhere to the guidance in 5.3.2.1 through 5.3.2.4.

5.3.2.1 The minimum passing score on the written and pattern identification examination components shall be established by the certification provider in conjunction with validation by subject matter experts and testing experts.

5.3.2.2 The practical exercise and the comprehensive scene exercise shall be graded on a pass/fail basis.

5.3.2.3 If a candidate fails any one of the four components of the certification examination, the certification provider shall require a six-month waiting period to apply to retake the failed component. The six-month waiting period starts on the date the candidate was notified of their assessment score by the certification provider.

5.3.2.4 If a candidate fails two or more components of the certification examination, the certification provider shall require a 12-month waiting period to apply to retake the entire examination (all four components). The 12-month waiting period starts on the date the candidate was notified of their assessment score by the certification test provider.

6 Recertification Criteria

6.1 Certification shall be in effect for a period of five years from the date of issue.

6.2 Application and administration of the recertification scheme shall be the responsibility of the certification provider.

6.3 The certification provider shall establish a minimum requirement for annual continuing education in accordance with ASTM E2917-19a, *Standard Practice for Forensic Science Practitioner Training, Continuing Education, and Professional Development Programs*.

6.4 Applicants for recertification shall be required to comply with the requirements in 6.4.1 through 6.4.4.

6.4.1 The certification provider shall provide proof of annual continuing education in the bloodstain pattern analysis discipline in accordance with ASTM E2917-19a, *Standard Practice for*

Forensic Science Practitioner Training, Continuing Education, and Professional Development Programs.

6.4.2 Documentation of continued involvement in the bloodstain pattern analysis discipline shall be defined by the certification provider.

6.4.3 Participate in an examination demonstrating continued competency in the area of bloodstain pattern analysis. The examination shall consist of the following three components.

a) *Pattern classification*: classify a minimum of ten (10) provider created bloodstain patterns representative of the full range of patterns that may be encountered in case work, in terms of complexity and difficulty.

b) *Area of Convergence and Area of Origin Exercise*: a minimum of 1 (one) area of convergence and area of origin determination of a bloodstain pattern created by the provider.

c) *Analytical Exercise*: a section to test the candidate's analytical abilities regarding BPA principles where the candidate is provided bloodstain photographs and investigative questions representative of the full range of patterns that may be encountered in case work, in terms of complexity and difficulty. There shall be a minimum of ten (10) scenarios.

6.4.4 Recertification examinations shall be proctored.

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