

Scientific Working Group on Bloodstain Pattern Analysis: Guidelines for Developing Standard Operating Procedures for Bloodstain Pattern Analysis

Scientific Working Group on Bloodstain Pattern Analysis (SWGSTAIN)

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Objective

This document provides guidelines for the development of Standard Operating Procedures (SOPs), an essential component of a Bloodstain Pattern Analysis (BPA) quality assurance program.

This document is not all encompassing nor is it intended to serve as a working SOP, but merely to provide guidance in the preparation of the SOP.

It is intended to be applicable to scene, laboratory, and remote examinations.

Introduction

The Scientific Working Group on Bloodstain Pattern Analysis (SWGSTAIN) comprises recognized BPA 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 can 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 following are guidelines for SOPs as they relate to BPA. The individual components are listed in bullet format, but it is not necessary to address each component in its own section of an SOP.

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

Standard Operating Procedures

The agency must have written and approved SOPs regarding BPA. Items that should be included are:

- 1 Title
- 2 Scope
- 3 Equipment, Materials and Reagents
- 4 Procedures
- 5 Report Generation, Review and Approval
- 6 Calculations
- 7 Limitations
- 8 Safety
- 9 References
- 10 SOP Approval

1. TITLE

The title should be a heading identifying the SOP.

2. SCOPE

This section of the document should define the scope of the SOP as it relates to BPA performed by the agency.

3. EQUIPMENT, MATERIALS, AND REAGENTS

This section of the SOP should address the equipment, materials and reagents used. Where essential to the quality of the examination, the agency should identify the operational parameters of these items. [See Appendix A for examples of equipment, materials and reagents.]

4. PROCEDURES

This section of the SOP should address the procedures used. The following elements should be included in a protocol for BPA:

4.1 Information Retrieval - This section of the SOP should address the retrieval of case specific information to assist in the BPA, which may include but is not limited to:

- The location and number of scenes, scene accessibility and scene conditions (e.g. indoors or outdoors, environmental conditions, public or private)
- Persons having had access to the scene and the extent of their involvement (e.g., witnesses, first responders, medical personnel)
- Relevant reports, statements, and consultations
- Whether other blood-shedding events are known to have occurred prior to the event in question
- Whether appropriate legal access has been obtained

- Previously observed condition of bloodstains
- Information relating to the bleeding persons, such as:
 - Number of bleeding persons
 - Cause and manner of death or injury and weapons involved, if known
 - Post mortem interval or time of event, if known
 - Location and types of wounds
- Other known sources of bleeding
- Information related to seized evidence items (e.g., clothing, weapons, etc.), such as:
 - Time, location, and condition of items when seized
 - History of item after seizure (e.g., chain of custody, prior examinations, storage conditions)

4.2 Pre-examination Preparation and Planning

This section of the SOP should address the preparatory steps necessary to conduct BPA, which may include but are not limited to:

4.2.1 Determining equipment needs – This section of the SOP should address the use of examination equipment and personal and scene protective equipment. (Refer to Appendix A)

4.2.2 Determining the need for assistance from other specialists – This section of the SOP should address factors that may affect the need for assistance, which may include but are not limited to:

- Safety and protection
- Multidisciplinary considerations (e.g., latent print examination, trace evidence)
- Additional BPA personnel
- Analyst and investigator communication
- Technical support

4.3 Data Collection

This section of the SOP should address techniques and procedures for collecting data specific to the analysis of bloodstain patterns, which may include but are not limited to:

4.3.1 Conducting a preliminary examination of the scene or item – This section of the SOP should address factors to consider when conducting a preliminary examination of the scene or item, which may include but are not limited to:

- Initial walk-through of the scene
- Documentation of physical information from the scene that may affect the BPA (e.g., temperature, humidity)
- Acquisition of initial photographs, images, video
- Awareness of potential transient physical evidence

4.3.2 Documenting and examining the scene or item utilizing a methodical and systematic approach – This section of the SOP should address the methods to be considered for documenting the scene or item, which may include but are not limited to:

4.3.2.1 Image capture – This section of the SOP should address factors to be considered for the photography or videography of the scene or item.

These factors may include but are not limited to:

- Image capture and storage
- Collection of overall, midrange, and close-up images
- Use of scales and unique identifiers

4.3.2.2 Sketches – This section of the SOP should address sketching the scene or item. It is recommended that

the scene or item be sketched with particular emphasis on the location of bloodstain patterns. The sketch may assist in a more focused examination by showing the spatial relationship of each bloodstain pattern to other stain patterns or to objects at the scene.

4.3.2.3

Notes – This section of the SOP should address factors to be considered when generating notes, which may include but are not limited to:

- Notes may be written or audio recorded
- Notes should be complete and accurate
- Notes should include but are not limited to:
 - Case identifier(s)
 - Identity of the examiner(s)
 - Date of activities
 - A description of the scene or items
 - A description of the location and absence of staining (e.g., surface texture, voids)
 - A description of the size, shape, distribution, and appearance of stains within the bloodstain patterns using well defined and consistent terminology (refer to SWGSTAIN: Recommended Terminology)

4.3.2.4

Collection of analytical data – This section of the SOP should address the methods and procedures utilized in the collection of analytical data relevant to

blood source location (e.g., area of origin, area of convergence, etc.).

- 4.3.3 Conducting presumptive blood testing – This section of the SOP should address the operational parameters involving the use of presumptive blood tests.
- 4.3.4 Collecting evidence for biological analysis – This section of the SOP should address factors to be taken into consideration for the collection of evidence for biological analysis. These factors may include, but are not limited to the following:
- Number of blood sources
 - Location and number of stains and stain patterns
 - Timing of the blood collection (so as to not interfere with the BPA)
 - Methods of collection
 - Species determination
 - Other biological fluid analyses
- 4.3.5 Determining the need for blood searching and enhancement – This section of the SOP should address the factors affecting the use of blood searching and visual enhancement techniques.
- 4.3.6 Conducting a final survey – This section of the SOP should address factors to be taken into consideration for the completion of a final survey of the scene or item. These factors may include, but are not limited to the following:
- Review of preliminary findings and documentation
 - Discussions with other personnel, as appropriate
 - Review of evidence collection
 - Removal and decontamination (if appropriate) of BPA equipment and supplies

4.4 Data Review and Analysis

This section of the SOP should address the procedures for reviewing and analyzing the collected data and other associated information to generate conclusions with regard to the BPA. Factors to consider include, but are not limited to:

4.4.1 Materials and documentation (e.g., notes, sketches, images, and recordings)

4.4.2 Evaluation of bloodstain evidence – This section of the SOP should describe the method used to identify viable mechanisms that could produce the pattern(s) under consideration. Some factors to consider include, but are not limited to:

- Scene context
- Complexity of the patterns
- Area of origin determination (e.g., string line, tangent, computer analysis)
- Terminology
- Relevant literature
- Training and experience
- Limitations

4.4.3 Relevant reports, statements and consultations -

- Relevant reports and other related materials (e.g., medical records, autopsy reports, photographs, videos, lab reports, police reports, and scene diagrams)
- Relevant statements
- Other experts' reports and statements

4.4.4 Reconstruction experimentation – This section of the SOP should address the need to periodically design and conduct case-specific BPA experiments.

5. REPORT GENERATION, REVIEW AND APPROVAL

The section of the SOP should address the criteria for report generation, review and approval to include:

5.1 The criteria for report generation –This section of the SOP must address the agency’s criteria for report generation.

5.2 Elements contained within the report – This section of the SOP must address the components of the report.

5.2.1 Elements that must be included in the report are:

- Case identifier
- Identity of the analyst(s)
- Date of report
- Name of submitting agency
- Items of evidence or materials evaluated (e.g., evidentiary items, images, other reports and transcripts)
- Observations and results
- Conclusions and opinions
- Definitions of BPA terms utilized in report (e.g., SWGSTAIN: Recommended Terminology)
- Appropriate disclaimers (e.g., photographic evidence only)
- Signature(s)

5.2.2 Elements that may be included, but not limited to, are:

- Case summary and date of occurrence
- Images
- Diagrams or sketches

- Chain of custody
- Disposition of the evidence
- Experiments conducted and their results

5.3 The process for report review and approval – This section of the SOP should address the agency's process for technical peer review and administrative approval.

6. CALCULATIONS

This section of the SOP should address the calculations used within the BPA. These may include but are not limited to:

6.1 Angle of Impact

6.2 Area of Origin

7. LIMITATIONS

This section of the SOP should address factors and circumstances that may affect the analysis of the bloodstain patterns and the subsequent conclusions. These factors may include but are not limited to:

7.1 Lack of blood source information

7.2 Environmental factors

7.3 Scene integrity and access

7.4 Measurement precision

7.5 Calculation limitations and outcomes

7.6 Evidence history and condition

7.7 Quality of documentation and photography

8. SAFETY

This section of the SOP should address specific safety issues related to the exposure to physical, chemical, and biological hazards.

9. REFERENCES

This section of the SOP should list all source material used in the development of the SOP.

10. SOP APPROVAL

This section of the SOP should include a process for documenting the approval and periodic review of the SOP.

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.