Bloodstain Pattern Analysis With An Introduction To Crime Scene Reconstruction Third Edition Practical Aspects Of Criminal And Forensic Investigations

Principles of Bloodstain Pattern Analysis-Stuart H. James 2005-05-26 Bloodstain evidence has become a deciding factor in the outcome of many of the world's most notorious criminal cases. As a result, substantiation of this evidence is crucial to those on either side of the courtroom aisle. The challenge is to obtain an authoritative reference that provides the latest information in a comprehensive and effective manner. Principles of Bloodstain Pattern Analysis: Theory and Practice presents an in-depth investigation of this important subject matter. A multidisciplinary approach is presented throughout the book that uses scene and laboratory examinations in conjunction with forensic pathology, forensic serology, and chemical enhancement techniques. Emphasis is on a thought process based on taxonomic classification of bloodstains that takes into account their physical characteristics of size, shape, and distribution, and the specific mechanisms that produce them. Individual chapters analyze case studies, with two chapters specifically discussing the details of legal issues as they pertain to bloodstain pattern analysis. Information highlighted throughout the book includes an examination of bloodstained clothing and footwear and information on bloodstain interpretation for crime scene reconstruction. Dramatic color images of bloodstaining injuries, bloodstains, and crime scenes are also presented to complement the technical content of this resource. Features § Provides 500 full color photographs - the first bloodstain pattern book presenting dramatic full color images of bloodstaining injuries, bloodstains, and crime scenes § Contains appendices with scientific data that includes trigonometric tables and metric equivalents, as well as crime scene and laboratory check lists, and biohazard safety precautions § Discloses court decisions relating to bloodstain pattern analysis and presumptive blood testing § Written by authors with many years of experience in the field, and features chapters contributed by qualified and respected forensic scientists and attorneys

Bloodstain Pattern Analysis-Tom Bevel 2001-09-26 Bloodstain pattern analysis helps establish events associated with violent crimes. It is a critical bridge between forensics and the definition of a precise crime reconstruction. The second edition of this bestselling book is thoroughly updated to employ the latest tools, including the application of scientific method, the use of flow charts, and the inter-relationship of crime scene analysis to criminal profiling. It provides more illustrations, including color photographs, and explains the use of computer programs to create demonstrative evidence for court.

Bloodstain Pattern Analysis with an Introduction to Crime Scene Reconstruction, Third Edition-Tom Bevel 2008-04-08 Objective establishment of the truth is the goal of any good crime scene investigator. This demands a consideration of all evidence available using proven scientific methodologies to establish objective snapshots of the crime. The majority of forensic disciplines shed light on thewho of a crime, bloodstain pattern analysis is one of the most imp

Principles of Bloodstain Pattern Analysis-Stuart H. James 2005-05-26 Bloodstain evidence has become a deciding factor in the outcome of many of the world’s most notorious criminal cases. As a result, substantiation of this evidence is crucial to those on either side of the courtroom aisle. The challenge is to obtain an authoritative reference that provides the latest information in a comprehensive and effective manner. Principles of Bloodstain Pattern Analysis: Theory and Practice presents an in-depth investigation of this important subject matter. A multidisciplinary approach is presented throughout the book that uses scene and laboratory examinations in conjunction with forensic pathology, forensic serology, and chemical enhancement techniques. Emphasis is on a thought process based on taxonomic classification of bloodstains that takes into account their physical characteristics of size, shape, and distribution, and the specific mechanisms that produce them. Individual chapters analyze case studies, with two chapters specifically discussing the details of legal issues as they pertain to bloodstain pattern analysis. Information highlighted throughout the book includes an examination of bloodstained clothing and footwear and information on bloodstain interpretation for crime scene reconstruction. Dramatic color images of bloodstaining injuries, bloodstains, and crime scenes are also presented to complement the technical content of this resource. Features § Provides 500 full color photographs - the first bloodstain pattern book presenting dramatic full color images of bloodstaining injuries, bloodstains, and crime scenes § Contains appendices with scientific data that includes trigonometric tables and metric equivalents, as well as crime scene and laboratory check lists, and biohazard safety precautions § Discloses court decisions relating to bloodstain pattern analysis and presumptive blood testing § Written by authors with many years of experience in the field.
Bloodstain Pattern Analysis in Crime Scenarios-Kapcer Choromanski 2020-12-12 This book introduces the core concepts of bloodstain pattern analysis that help to understand and make independent contributions to crime scenes accurately. It presents a bridge between new research results and the practical work field of crime scene investigation in bloodstain pattern analysis, by showing and detailing reports of two different scenarios. The scenarios presented have an extensive description of gathered evidence and are diversified with real crime scene photography and sketches. This kind of case report is rare in scientific books, but the author, as a researcher, has permission from the authorities to present the cases. The book finally concludes with the main problems of modern bloodstain pattern analysis and discusses the way forward.

Bloodstain Patterns-Anita Y. Wonder 2015-01-07 Bloodstain Patterns: Identification, Interpretation and Application combines material from Blood Dynamics (2001) and Bloodstain Pattern Evidence (2007) with updated case work and scientific advances from medical and hard sciences. The text expands coverage of such areas as arterial damage pattern identification, staging of crime scenes, legal applications and problems from both sides of the bench, and extending teaching and training to those outside criminal justice. With violent offenders more aware of crime scene investigation techniques and attempting to frame others, the text expands outdated basic training programs that are insufficient to identify attempts to confuse the investigation. This book clarifies previous understandings as well as bridges the gap toward future advance courses. Based on the work of Paul Leland Kirk, the book’s focus is on first line investigators’ accuracy in identifying specific bloodstain patterns, correctly interpreting and applying them to casework. Combines and updates material from Blood Dynamics and Bloodstain Pattern Evidence into one comprehensive reference Covers new topics, including arterial damage pattern identification, staging of crime scenes, legal applications, and problems from both sides of the bench. More than 300 full color photographs, some with line overlays showing the objective criteria which identify patterns

Scientific and Legal Applications of Bloodstain Pattern Interpretation-Stuart H. James 2018-02-06 Since 1955 when Dr. Paul Kirk first presented a bloodstain evidence affidavit in State of Ohio v. Samuel Sheppard, expert testimony on bloodstain interpretation has gained widespread acceptance in U.S. courts. Scientific and Legal Applications of Bloodstain Pattern Interpretation brings together some of the most respected and noted experts in forensic science, the law, and bloodstain interpretation to provide a comprehensive overview of the discipline. It discusses research, applications, and the current view of bloodstain pattern interpretation within the legal system at the trial and appellate court levels, as well as scientific approaches and developments in the field. Scientific and Legal Applications of Bloodstain Pattern Interpretation will help attorneys who are questioning and cross-examining expert witnesses have a good working knowledge of bloodstain interpretation. Included is a full-color atlas of bloodstains, in conjunction with a glossary of terms and an outline of basic laboratory experiments that are commonly used in the discipline. Among the outstanding contributions in this volume you will find: An excellent overview of the law and legal reference by Carol Henderson discusses pattern evidence in detail. A post-conviction analysis by Marie Elena Saccoccio evaluates how bloodstain evidence can play a role in the appeal process. Misinterpretation and overinterpretation of bloodstain evidence can occur in our courts of law-be prepared to effectively analyze the evidence and the testimony with Scientific and Legal Applications of Bloodstain Pattern Interpretation.

Crime Scene Bloodstain Pattern Analysis Workbook-N. Leroy Parker 2014-01-22 This workbook is designed to assist the Crime Scene Analyst, Technician or Investigator in documenting bloodstained patterns that are located at the crime scene or on bloodstained items that are submitted for an analysis. It is also designed to assist the Crime Scene Analyst, Technician or Investigator in reconstructing or analyzing a bloodstained crime scene or a bloodstained item for which a bloodstain pattern analysis is requested. The documentation could be accomplished with overhead photographs and close-up photographs using 2.3 or 6 centimeter stick-on tapes that should be placed in the center of each rectangular area. The documentation should also consist of notes and rough sketches with measurements. The close-up photographs of the rectangular areas with the 2.3 or 6 inches stick-on tapes that were placed in the center of those areas should be taken with a parallel film camera plane. The stick-on tapes should be labeled according to the surface on which they would be placed. Example: West wall of living room #1 (ww of lr #1) and west wall of living room #2 (ww of lr #2) etc. The number of close-up photographs would be determined by the number of rectangular areas with the stick-on tapes. Example: At least ten (10) close-up photographs should be taken if ten (10) stick-on tapes were placed on the bloodstained surface. The bloodstain pattern reconstruction or analysis should be done by first recognizing and or identifying the many different types of patterns in a bloodstained scene or on a bloody item. The next step should involve the reconstruction of the points or areas of convergence and origin and then a determination of how the other patterns were most likely created. The workbook contains several tasks and assignments that would provide the student with the tools to accomplish the documentation and analysis. The Crime Scene Analyst, Technician or Investigator after successfully completing the workbook/workshop should be aware that: 1.0 Single drops of blood in a crime scene or on an item were influenced by the surface from which the blood fell (the volume); the diameter, the shape, the impact angle, the scalloping of the perimeter and the direction of travel of the dropped blood that impacted the target surface (the volume, the height from which the blood fell, the texture of the target surface on which the blood fell, the angle of the targeted bloodstained surface and the horizontal speed of the source that issued the blood). 2.0 Numerous drops of blood in the same pattern in a crime scene or on an item were influenced by the force or the impact (less than 25 feet per second – dropped blood and cast-off bloodstain); (25 to 100 feet per second – medium velocity bloodstain); (over 100 feet per second – high velocity bloodstain); projected blood (arterial bleeding); transfer of blood from one object to another (contact or transfer bloodstains, imprint bloodstains, smears or wipes and wipes); large volumes of blood (splashed or pooled blood) 3.0 The reconstruction or analysis of the points or areas of origin could be determined by strings, scaled drawings or calculations. The interpretation of the other patterns (non impact) along with the Medical Examiner’s autopsy report should allow the crime scene analyst, technician or investigator to complete a bloodstain pattern analysis report and if possible explain and or testify to the sequence of events that occurred at the crime scene.

Blood Dynamics-Anita Y. Wonder 2001 Today's resources on bloodstain analysis are still based on methods that were derived in the 1920s. Although medical and clinical research have provided a growing body of information on blood composition and behavior, this information has been ignored in favor of historical bloodstain analysis methods until now. With 25 years of experience in the field, author Anita Wonder shows how to use these new methods for interpreting bloodstains, including non-Newtonian fluid behavior (a process that does not conform to Sir Isaac Newton’s laws of motion) and three-dimensional dispersion modeling. Blood Dynamics focuses on how to accurately identify eight bloodstain pattern types and their permutations. It covers every aspect of bloodstain analysis, and shows how some standard practices of reconstruction are not only unnecessary for identification of blood dynamics, but can even be misleading. This book presents completely new scientific evaluations of blood dynamics and will fundamentally change the way in which bloodstains are interpreted. As such, it will be required reading for anyone who deals with blood evidence at the crime scene, in the lab, or in the courtroom. * Presents groundbreaking new methods for interpreting bloodstains, including non-Newtonian fluid behaviour and three-dimensional dispersion modelling * Covers every aspect of bloodstain analysis * Focuses on how to accurately identify eight bloodstain pattern types and their permutations * Author, Anita Wonder has 25 years of experience in the field of blood dynamics

Bloodstain Pattern Evidence-Anita Y. Wonder 2011-08-29 In Bloodstain Pattern Evidence, the concepts introduced in the author's first book, Blood Dynamics, are updated and applied to provide essential answers in the resolution of actual crimes. The book is accessible to all levels of investigators, regardless of academic background, and allows readers to develop a fundamental understanding of the underlying scientific principles behind bloodstain pattern evidence. Bloodstain Pattern Evidence builds on the fundamental ideas brought about by an understanding of Non-Newtonian dynamics, and illustrates through case work the practical forensic science applications of these principles to the analysis of bloodstain patterns. Extensive case examples provide practical application of essential pattern analysis principles Extensively illustrated with over 350 photos and line drawings Takes a unique and scientific approach to bloodstain pattern analysis by exploring the fundamentals of fluid behavior

Bloodstain Pattern Analysis (First Edition)-R. Craig Gravel 2018-11-15 Bloodstain Pattern Analysis: Level 1 Lab Manual provides students with basic knowledge about bloodstain pattern analysis and the opportunity to
Practical Crime Scene Analysis and Reconstruction-Ross M. Gardner 2009-06-26 Crime scene reconstruction (CSR) is today’s hot topic. The immense proliferation of television, print, and electronic media directed at this area has generated significant public interest, albeit occasionally encouraging inaccurate perceptions. Practical Crime Scene Analysis and Reconstruction bridges the gap between perception and reality, helping Crime Scene Bloodstain Pattern Analysis Workbook: N. Leroy Parker 2014-01 This workbook is designed to assist the Crime Scene Analyst, Technician or Investigator in documenting bloodstained patterns that are located at the crime scene or on bloodstained items that are submitted for an analysis. It is also designed to assist the Crime Scene Analyst, Technician or Investigator in reconstructing or analyzing a bloodstained crime scene or a bloodstained item for which a bloodstain pattern analysis is requested. The documentation could be accomplished with overall, midrange photographs and close-up photographs with 2, 3 or 6 centimeter stick-on tapes that should be placed in the center of each rectangular area. The documentation should consist of sketches with measurements. The close-up photographs of the rectangular areas with the 2, 3 or 6 inches stick-on tapes that were placed in the center of those areas should be taken with a parallel film camera plane. The stick-on tapes should be labeled according to the surface on which they would be placed. Example: West wall of living room #1 (ww of lr #1) and west wall of living room #2 (ww of lr #2). The number of close-up photographs would be determined by the number of rectangular areas on the surface. The number of the last (10) close-up photographs should be taken if ten (10) stick-on tapes were placed on the bloodstained surface. The bloodstain pattern reconstruction or analysis should be done by first recognizing and identifying the many different types of patterns in a bloodstained scene or on a bloody item. The next step should involve the reconstruction of the points or areas of convergence and origin and then a determination of how the other patterns were most likely created. The workbook contains several tasks and assignments that would provide the student with the tools to accomplish the documentation and analysis. The Crime Scene Analyst, Technician or Investigator after successfully completing the workbook/workshop should be aware that: 1. Single drops of blood in a crime scene or on an item were influenced by the surface from which the blood fell (the volume), the diameter, the shape, the impact angle, the scalloping of the perimeter and the direction of travel of the dropped blood that impacted the target surface (the volume, the height from which the blood fell, the texture of the target surface on which the blood fell, the angle of the targeted bloodstained surface and the horizontal spread of the source that issued the blood). 2.0 Numerous drops of blood in the same pattern in a crime scene or on an item were influenced by the force or the impact (less than 25 feet per second - dropped blood and cast-off bloodstain); (25 to 100 feet per second - medium velocity bloodstain); (over 100 feet per second - high velocity bloodstain); projected blood (arterial bleeding); transfer of blood from one object to another (contact or transfer bloodstains, imprint bloodstains, smears or scratches and wipes); large volumes of blood (splashed or pooled blood) 3.0 The reconstruction or analysis of the points or areas of origin could be determined from the bloodstains, scaled drawings or calculations. The interpretation of the other patterns (non impact) along with the Medical Examiner’s autopsy report should allow the crime scene analyst, technician or investigator to complete a bloodstain pattern analysis report and if possible explain and or testify to the sequence of events that occurred at the crime scene.

Forensic Evidence in Court-Craig Adam 2016-07-12 The interpretation and evaluation of scientific evidence and its presentation in a court of law is central both to the role of the forensic scientist as an expert witness and to the interests of justice. This book aims to provide a thorough and detailed discussion of the principles and practice of evidence interpretation and evaluation by using real cases by way of illustration. The presentation is appropriate for students of forensic science or related disciplines at advanced undergraduate and master’s level or for practitioners engaged in continuing professional development activity. The book is structured in three sections. The first sets the scene by describing and debating the issues around the admissibility and reliability of scientific evidence presented to the court. In the second section, the principles underpinning interpretation and evaluation are explained, including discussion of those formal statistical methods founded on Bayesian inference. The following chapters present perspectives on the evaluation and presentation of evidence in the context of a single type or class of scientific evidence, from DNA to the analysis of documents. For each, the science underlying the analysis and interpretation of the forensic materials is explained, followed by the presentation of cases which illustrate the variety of approaches that have been taken in providing expert scientific opinion.

Practical Crime Scene Processing and Investigation, Second Edition-Ross M. Gardner 2016-04-19 All too often, the weakest link in the chain of criminal justice is the crime scene investigation. Improper collection of evidence blocks the finding of truth. Now in its second edition, Practical Crime Scene Processing and Investigation presents practical, proven methods to be used at any crime scene to ensure that evidence is admissible and persuasive. Accompanied by more than 300 color photographs, topics discussed include: Understanding the nature of physical evidence, including fingerprint, biological, trace, hair, and fiber, and other forms of evidence (Actions of the responding officer, from documenting and securing the initial information to providing emergency care Assessing the scene, including search considerations and dealing with chemical and bioterror hazards Crime scene photography, sketching, mapping, and notes and reports Light technology and preserving fingerprint and impression evidence Shooting scene documentation and reconstruction Bloodstain pattern analysis and the body as a crime scene Special scene considerations, including fire, burned bodies, and entomological evidence The role of crime scene analysis and reconstruction, with step-by-step procedures Two appendices provide additional information on crime scene equipment and risk management, and each chapter is enhanced by a succinct summary, suggested readings, and a series of questions to test assimilation of the material. Using this book in your investigations will help you find out what happened and who is responsible.

Forensic Science-Stuart H. James 2014-01-13 Covering a range of fundamental topics essential to modern forensic science, the second edition of Practical Crime Scene Processing and Investigation presents contributions from experts in the field who discuss case studies from their own personal files. This edition has been thoroughly updated to r

Wiley Encyclopedia of Forensic Science-Allan Jamieson 2009-06-29 This A to Z encyclopedia provides a comprehensive, definitive, and up-to-date reference of the many areas of specialist and expert knowledge and skills used by those involved in all aspects of the forensic process, including, but not limited to, forensic scientists, doctors, practicing and academic lawyers, paralegals, police, crime scene investigators, analytical chemists, behavioral scientists and toxicologists. This five-volume covers all topics which, either as part of an established forensic discipline or as a potentially useful emerging discipline, are of interest to those involved in the forensic process. This includes both the scientific methodology and the admissibility of evidence. The encyclopedia also provides case studies of landmark cases in the definition and practice of forensic science. Wiley Encyclopedia of Forensic Science presents all material on a level and in a style that makes it accessible to a wide range of readers. In particular, lawyers needing to better understand the key aspects of the science, and scientists who require a deeper insight into legal issues will find the encyclopedia an important resource, as will physical, biological and behavioral scientists who require background information on the most important aspects of each other’s areas of expertise.

Forensic Science Reform-Wendy J Koon 2016-12-16 Forensic Science Reform: Protecting the Innocent is written for the nonscientist to help make complicated scientific information clear and concise enough for attorneys and judges to master. This volume covers physical forensic science, namely arson, shaken baby syndrome, non accidental trauma, bite marks, DNA, fibers, fibrous, glass, paints, lubrication, drains, hair and hair fiber analysis, and contains valuable contributions from leading experts in the field of forensic science. Offers training for prosecuting attorneys on the present state of the forensic sciences in order to avoid reliance on legal precedent that lags decades behind the science Provides defense attorneys the knowledge to defend their clients
Practical Crime Scene Processing and Investigation, Third Edition-Ross M. Gardner 2018-09-20 Every action performed by a crime scene investigator has an underlying purpose: to both recover evidence and capture context. It is imperative that crime scene investigators must understand their mandate—not only as an essential function of their job but because they have the immense responsibility and duty to do so. Practice Crime Scene Processing and Investigation, Third Edition provides the essential tools for what crime scene investigators need to know, what they need to do, and how to do it. As professionals, any investigator’s master is the truth and only the truth. Professional ethics demands an absolute adherence to this mandate. When investigators can effectively seek, collect, and preserve information and evidence from the crime scene to the justice system—doing so without any agenda beyond seeking the truth—not only are they carrying out the essential function and duty of their job, it also increases the likelihood that the ultimate goal of true justice will be served. Richly illustrated—with more than 415 figures, including over 300 color photographs—the Third Edition of this best-seller thoroughly addresses the role of the crime scene investigator in the context of: Understanding the nature of physical evidence, including fingerprint, biological, trace, hair and fiber, impression, and other forms of evidence Assessing the scene, including search considerations and dealing with chemical and bioterror hazards Crime scene photography; scene sketching, mapping, and documentation; and the role of crime scene analysis and reconstruction Bloodstain pattern analysis and discussion of the body as a crime scene Special consideration of human remains; buried bodies, and entomology Understanding the importance of maintaining objectivity, emphasizing that every action the crime scene investigator performs has an underlying purpose: to both recover evidence and capture scene context. Key features: Outlines the responsibilities of the responding officer, from documenting and securing the initial information to providing emergency care Includes three new chapters on light technology and crime scene processing techniques, recovering fingerprints, and castings Addresses emerging technology and new techniques in 3-D Laser scanning procedures in capturing a scene Provides a detailed review of the chapters at the end of each chapter Practice Crime Scene Processing and Investigation, Third Edition includes practical, proven methods to be used at any crime scene to ensure that evidence is preserved, admissible in court, and persuasive. Course ancillaries including PowerPoint® lecture slides and a Test Bank are available with qualified course adoption.

Bloodstain Pattern Analysis-Craig Gravel 2018-11-15 Bloodstain Pattern Analysis: Level 1 Lab Manual provides students with basic knowledge about bloodstain pattern analysis and the opportunity to conduct experiments to demonstrate the dynamics of blood in flight. The manual and associated exercises show how bloodstain pattern analysis is used as a forensic science discipline, illustrate the information that can be obtained from bloodstain evidence, and help students analyze actual bloodstain patterns. Students learn the terminology and mathematics associated with the discipline and apply the information to sample bloodstain patterns. They are challenged to interpret specific patterns and to use their newfound knowledge to reconstruct a mock crime scene. Upon completion of a course that uses this lab manual, students are qualified to join the International Association for Bloodstain Pattern Analysis, which is the first step toward taking the International Association of Identification Bloodstain Pattern Analysis certification test. Bloodstain Pattern Analysis is a dynamic lab manual that is ideal for students taking introductory forensic science, law enforcement, or criminology courses. This resource could be especially helpful for active police officers and forensic scientists. R. Craig Gravel is an instructor at the University of Central Oklahoma Forensic Science Institute, a certified Bloodstain Pattern Analyst, and a retired Oklahoma City Police Lieutenant. He served on the force for 25 years, working in the larceny, missing person, robbery and homicide units and serving as crime scene unit supervisor. He holds a master’s degree in criminal justice administration from Oklahoma City University. Mia L. White is a crime scene investigator at the Edmond Police Department in Edmond, Oklahoma and has a degree in forensic science from Central Oklahoma Forensic Science Institute. She is a member of the Oklahoma division of the International Association for Identification and the International Association for Bloodstain Pattern Analysis.

Bloodstain Pattern Analysis-Sonya Ching-Ying Siu 2012 Bloodstain pattern analysis (BPA) provides significant evidentiary value in crime scene interpretation and reconstruction, but many aspects of BPA are controversial due to the heavy reliance on qualitative and subjective interpretation. For example, the differentiation between so-called “medium” and “high” velocity impact spatter patterns - legacy terminology typically associated with blunt instrument and gunshot impacts, respectively - has traditionally relied on visual assessment of the average drop size in the pattern. Because this methodology is subjective and susceptible to context bias, most BPA organizations recommend against even attempting to describe the velocity that creates a spatter pattern, despite the clear forensic value of such determinations in crime scene interpretation. In this work, we develop a quantitative methodology using digital image analysis techniques to differentiate medium and high velocity impact spatter patterns in an objective manner. Bloodstain spatter patterns were created under controlled conditions by impacting either blunt instruments or bullets into blood-soaked sponges. The impact velocities were determined using high-speed video, and the resulting spatter patterns were digitally imaged at high resolution. We analyzed over 180 spatter patterns from drop impacts with both 2 oz and 9 mm bullets. The spatter patterns were digitally imaged at high resolution and the resulting images were analyzed using custom image analysis algorithms. Our analysis of 72 unique spatter patterns, comprising more than 490,000 individual droplets, indicates that the mean drop size in a gunshot spatter pattern is at most 30% smaller than the mean drop size in blunt instrument patterns. In contrast, we demonstrate that the spatially-dependent size distribution of droplets - i.e. drop sizes as a function of position in the pattern - significantly differs between bullet and blunt instrument patterns, with a spatially-dependent metric as much as 400% larger for bullet impacts. Our findings suggest that quantitative metrics involving the spatial distribution of droplets within a spatter pattern can be used for objective differentiation between blunt instrument and gunshot spatter patterns.
as with the quantitative methods. The reliability for these methodologies was performed by examining the proportion of accurate and inaccurate answers under each testing conditions. Findings from this study showed that the methodologies used by BPA are in need of improvements. Currently, the reliability of results is highly dependent on the conditions that the bloodstain pattern was created under. It is important to develop more markers that can assist BPA analysts in identifying the bloodstain patterns with confidence. In this project, some features were being identified during the examination of bloodstain patterns, which may be valuable markers for BPA interpretations. 

Bloodstain Pattern Analysis-Jennifer Paige Saifi 2012

Bloodstain Pattern Analysis (BPA) has traditionally involved qualitative characterizations that rely primarily on the visual aspects of a particular stain. Because of this reliance on visual assessment, BPA has been criticized for perceived subjectivity, lack of scientific support, and susceptibility to context bias. One major source of controversy involves the differentiation between so-called "medium velocity" and "high velocity" patterns, the legacy terminology often associated with stains generated by blunt instrument and gunshot impacts respectively. Despite the clear forensic value in assessing the type of impact that generated a particular spatter pattern, the controversy surrounding this differentiation has led most analysts to avoid such assessments. To date, no data or guidelines exist to specify under what conditions medium or high velocity bloodstain patterns can be reliably identified. In this work, we present a double-blind investigation of the error rates associated with identification of impact velocity based on visual assessments of bloodstain patterns. Two cohorts of individuals, ten highly trained BPA analysts and ten forensic science graduate students, both visually assessed the same set of 100 bloodstain patterns created in a controlled environment with known impact velocities and target distances; in this manner, we investigated the accuracy of 2,000 unique bloodstain pattern assessments. We find that the "high velocity" patterns generated by gunshot were identified with high accuracy, yielding an error rate of only 0.21% amongst the trained BPA analysts. In contrast, the "medium velocity" patterns generated by blunt instrument impacts were much more problematic, yielding analyst error rates as high as 38%. We demonstrate that it is statistically more likely for the blunt instrument spatter patterns to be incorrectly identified as "high velocity" bloodstains when there is a preponderance of small drops located near the pattern's center, thus mimicking one of the key visual cues for a high velocity pattern. Moreover, we find that the respondents had on average a 30% probability of unknowingly changing their assessment when presented with the same medium velocity pattern simply rotated 180 degrees, indicating that the error rates had a significant stochastic aspect. Our findings suggest that great caution should be exercised when assessing the impact velocity for a spatter pattern in the absence of secondary indicia, and highlight the need for more objective criteria for interpreting bloodstain spatter patterns.

Bloodstain Pattern Analysis-Bethany Alexandria Jane Larkin 2015

Bloodstain Pattern Analysis-Kaelyn Alyssa Heikens 2012