

**Using the National Academy of Science Report ‘Strengthening Forensic Science in the United States: A Path Forward’ as a Criminal Defense Tool in Florida**

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## INTRODUCTION

This paper was written with the intent to summarize the National Academy of Sciences' report on forensic science practices in the United States for criminal defense law practitioners in the state of Florida. The paper was originally conceived as a training session and accompanying manual for the Miami-Dade Public Defender's Office.

The intent is not to condemn the sciences or practices that have been taught by extremely intelligent and experienced forensic science practitioners and academics, and have been used in many successful investigations. Instead, this paper summarizes the report and proffers that not all forensic science practices have the ability to meet the rigid standards of established reliability and general acceptance by the community, and thus should be used as exculpatory evidence rather than individualized evidence of guilt.

Advances in forensic science have exposed that, on occasion, both faulty forensic science and faulty testimony have led to the wrongful convictions of innocent persons and permitted the freedom of the actual perpetrator. By advancing the field of forensic science, we increase the potential to assist law enforcement in identifying true perpetrators; while at the same time lessening the potential occurrence of wrongful convictions.

The paper begins with a summary of the Report and its findings and then continues on to examine how defense attorneys in Florida may use the NAS Report to counter expert witnesses proffered by the state. Finally, the paper illustrates how the NAS Report is being used in cases across the country.

## I. STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD

### A. BACKGROUND OF THE NATIONAL ACADEMY OF SCIENCES

The National Academy of Sciences (NAS) was instituted by charter in 1863 with a mandate to advise the government on scientific and technical matters: "investigate, examine, experiment, and report upon any subject of science or art whenever called upon to do so by any department of the government."<sup>1</sup> The Academy membership is composed of approximately 2,100 members and 380 foreign associates, of whom nearly 200 have won Nobel Prizes.<sup>2</sup>

### B. SUMMARY OF THE NAS REPORT ON FORENSIC SCIENCE

Congress initially requested the establishment of a committee to study forensic science in the United States in 2005 in the Science, State, Justice, Commerce, and Related Agencies Appropriations Act of 2006.<sup>3</sup> In 2009, NAS published a 352 page book entitled "Strengthening Forensic Science in the United States: A Path Forward" ("NAS Report").<sup>4</sup> The statute authorized NAS to conduct a study of forensic science.<sup>5</sup> NAS created The Forensic Science Committee with the aim being to outline an agenda for policy initiatives to promote progress in both the forensic science disciplines and the forensic science community.<sup>6</sup>

The committees' charge for the report was "*inter alia* to assess present and future needs of the forensic science community[;] make recommendations for maximizing forensic technologies and techniques to solve crimes, investigate deaths and protect the public; identify potential scientific advances; recommend programs which will increase the numbers of qualified forensic scientist[s] and medical examiners; disseminate best practices and guidelines concerning the collection and analysis of forensic evidence."<sup>7</sup>

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<sup>1</sup> NAS Report at III.

<sup>2</sup> NAS website. Available at [http://www.nasonline.org/site/PageServer?pagename=ABOUT\\_main\\_page](http://www.nasonline.org/site/PageServer?pagename=ABOUT_main_page)

<sup>3</sup> P.L. No. 109-108, 119 Stat. 2290 (2005). 2 H.R. Rep. No. 109-272, at 121 (2005) (Conf. Rep.). 3 S. Rep. No. 109-88, at 46 (2005).

<sup>4</sup> NAS Report at I.

<sup>5</sup> *Id.* at 1.

<sup>6</sup> *Id.*

<sup>7</sup> Schechter, Marvin E. *The National Academy of Sciences Forensic Report: An Overview, Recent Legal Developments And Thoughts on Post-Conviction Issues*, Presented at National Defender Train, Indianapolis, 2011.

The Committee listened to testimony from forensic practitioners; forensic laboratories and medical examiner/coroner office managers; forensic science professors; research scholars in numerous forensic science fields; scientists; and, members of the legal profession and law enforcement agencies prior to coming to the conclusions espoused in the Report.<sup>8</sup> The particular findings and suggestions contained within the report will be outlined in subsections of this section of the article.

The committee met on eight occasions throughout 2008. The issues covered during the sessions included [among other topics]:

- Forensic science practices. The forensic science practices reviewed by the committee were categorized as:<sup>9</sup>
  - Pattern/experience evidence:
    - Fingerprints (including the interoperability of AFIS), firearms examination, tool marks, bite marks, impressions (tires, footwear), bloodstain pattern analysis, handwriting, and, hair [hair comparison]
  - Analytical evidence:
    - DNA, [chemical] coatings (e.g. paint), chemicals (including drugs), [trace] materials (including fibers), fluids, serology, fire and explosive [debris] analysis.
  - Digital evidence
- The assessment of forensic methods and technologies, current training and education in forensic science.

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<sup>8</sup> *Id.*

<sup>9</sup> NAS Report at 3.

- The structure and operation of forensic science laboratories.
- The use of forensic evidence in criminal and civil litigation:
  - The collection and flow of evidence from crime scenes to courtrooms
  - The manner in which forensic practitioners testify in court
  - Cases involving the misinterpretation of forensic evidence
  - The adversarial system in criminal and civil litigation
  - Lawyers' use and misuse of forensic evidence
  - Judges' handling of forensic evidence

### C. RECOMMENDATIONS OF THE NAS REPORT COMMITTEE

The NAS Committee stated that there are three important purposes that will be served through advancing forensic science:

First, further improvements will assist law enforcement officials in the course of their investigations to identify perpetrators with higher reliability. Second, further improvements in forensic science practices should reduce the occurrence of wrongful convictions, which reduces the risk that true offenders continue to commit crimes while innocent persons inappropriately serve time. Third, any improvements in the forensic science disciplines will undoubtedly enhance the Nation's ability to address the needs of homeland security.<sup>10</sup>

While most forensic science practitioners have spent their professional careers advancing the field(s), there is much work to be accomplished in the future in order to establish practices that will ensure quality, reliability, and consistency in the collection, analysis, and testimony related to, evidence in criminal cases.<sup>11</sup>

The field of forensic science is vast and encompasses many different disciplines and specialties, each with its own measures of reliability, general acceptance by the scientific community, and potential rates of error. The field also encompasses practitioners with a wide

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<sup>10</sup> NAS Report at 4.

<sup>11</sup> *Id.* At 5.

array of backgrounds and educational levels, from law enforcement officers to scientists; and persons with low education levels and no science training to highly advanced degrees.<sup>12</sup> Law enforcement agencies vary widely in procedures related to evidence gathering and investigation, as well as agency resources related to evidence testing.<sup>13</sup>

The growing number of exonerations resulting from DNA have led to the need for more investigation into the forensic sciences and how they are used in criminal cases. For every exoneration of an innocent person, a guilty person was not justly convicted of the crime. Insufficient resources and a general lack of properly trained and qualified personnel have caused backlogged laboratories, leading to concerns about the effectiveness of the entire criminal justice system.<sup>14</sup>

Mishandled evidence has the potential to mislead juries and judges, thus contributing as a causal factor in wrongful convictions. This growing concern regarding evidence combined with the so-called CSI Effect, can lead to a loss of confidence in the system as a whole, leading to innocent convictions and guilty acquittals.<sup>15</sup> The Committee stated, “substantial improvement is necessary in the forensic science disciplines to enhance law enforcement’s ability to identify those who have or have not committed a crime and to prevent the criminal justice system from erroneously convicting or exonerating the persons who come before it.”<sup>16</sup>

The Innocence Project has exonerated 272 persons through the use of DNA since 1989 (as of July 23, 2011).<sup>17</sup> The Project reported that nearly 50% of exonerations had faulty or false

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<sup>12</sup> NAS Report at 35.

<sup>13</sup> *Id.*

<sup>14</sup> *Id.* at 37.

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> Innocence Project. See <http://www.innocenceproject.org/>

forensic science as a causal factor in the wrongful conviction.<sup>18</sup> A critical fact is that many of the forensic sciences have not been held to the same standards of scientific scrutiny as other scientific fields.<sup>19</sup> And some of the forensic sciences cannot meet the fundamental requirements of science: reproducibility, validity, and falsifiability.<sup>20</sup>

The forensic science community does not have the ability to conduct the research required to support the effect it has in the criminal justice system. The Report states that problems include lack of funding for independent forensic research, and DOJ commissioning of studies with almost no participation of the traditional scientific community.<sup>21</sup>

The most relevant recommendations by the Committee are as follows:

- (1) A National Institute of Forensic Science should be established to promote the development of forensic science into a field of multidisciplinary research and practice, founded on the systematic collection and analysis of relevant data, to focus on: establishing and enforcing best practices; establishing standards for the mandatory accreditation of forensic science laboratories and the mandatory certification of forensic scientists; developing programs to improve understanding of the forensic science disciplines and their limitations within legal systems.<sup>22</sup>
- (2) The establishment of standard terminology to be used in reporting on and testifying about forensic science results.<sup>23</sup>
- (3) Conduct research on issues of accuracy, reliability, and validity in forensic science.<sup>24</sup>

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<sup>18</sup> The Innocence Project. *Understand the causes: Invalidated or improper forensic science*. Available at <http://www.innocenceproject.org/understand/Unreliable-Limited-Science.php>.

<sup>19</sup> NAS Report at 42.

<sup>20</sup> *Id.* at 43.

<sup>21</sup> *Id.* at 44.

<sup>22</sup> Maw, E. NAS Report aftermath: litigation, legislation, and education update. Innocence Network Conference. Cincinnati, Ohio. April 2011.

<sup>23</sup> Maw at 2.

- (4) All public laboratories and facilities should be removed from the administrative control of law enforcement agencies or prosecutors’ offices, to improve the scientific bases of forensic science examinations and to maximize independence from or autonomy within the law enforcement community.<sup>25</sup>
- (5) Research “human observer bias and sources of human error” in forensic science and develop consistent operating protocols to minimize error.<sup>26</sup>
- (7) Establish mandatory individual certification of forensic scientists, and mandatory laboratory accreditation.<sup>27</sup>

## II. REPORT DESCRIPTIONS OF SPECIFIC FORENSIC SCIENCE PRACTICES

This section describes the forensic science practices that are most often used during investigations and trials; as well as those disciplines that were identified by the committee as “cause of concern” due to the scientific reliability not having been sufficiently established.<sup>28</sup>

The Committee focused on admissibility requirements, probative value, reliability, and precision of results<sup>29</sup>. Although not all forensic sciences have a solid scientific foundation, the committee notes that they retain the “capacity (or the potential) to provide probative information to advance a criminal investigation.<sup>30</sup> The Report contends that this is to be taken as the sciences retaining the capacity to exclude suspects or to offer leads to advance an investigation.<sup>31</sup>

There are two major classifications of forensic science: individualized evidence and classification evidence. Individualized evidence is proffered to link a singular person to the crime (i.e. DNA). Class evidence associates a class of persons to the crime (i.e., serology).

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<sup>24</sup> *Id.*

<sup>25</sup> *Id.*

<sup>26</sup> *Id.*

<sup>27</sup> *Id.*

<sup>28</sup> NAS Report at 127.

<sup>29</sup> *Id.*

<sup>30</sup> *Id.*

<sup>31</sup> *Id.*

Classification evidence indicates only that the item belongs to a particular class of similar items (i.e. blonde hair)

Nuclear DNA analysis is the only forensic science method that has been “rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source.”<sup>32</sup>

It should seem natural that the analytical based forensic sciences such as DNA are notably more consistently reliable and generally accepted when applied to either the *Frye*<sup>33</sup> and/or *Daubert*<sup>34</sup> standards as opposed to interpretation based forensic sciences. There is less room for error or varying interpretation of evidence when the item can be repeatedly tested and reliably garner the same result.

“Although some of the techniques used by the forensic science disciplines—such as DNA analysis, serology, forensic pathology, toxicology, chemical analysis, and digital and multimedia forensics—are built on solid bases of theory and research, many other techniques have been developed heuristically. That is, they are based on observation, experience, and reasoning without an underlying scientific theory, experiments designed to test the uncertainties and reliability of the method, or sufficient data that are collected and analyzed scientifically.”<sup>35</sup>

The possibility of receiving different DNA results from two laboratories is far less than the possibility of receiving different bloodstain interpretation results from two laboratories. This is because, even though modern bloodstain pattern analysts use trigonometry and sometimes physics, there is more room for differing interpretations by humans, thus resulting in a higher rate of possible error.

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<sup>32</sup> NAS Report at 7.

<sup>33</sup> *Frye v. U.S.*, 293 F. 1013 (1923).

<sup>34</sup> *Daubert v. Merrell Dow Pharmaceuticals*, 113 S.Ct. 2786 (1993).

<sup>35</sup> NAS Report at 128.

## A. PATTERN/EXPERIENCE EVIDENCE

### i. FRICTION RIDGE ANALYSIS

Friction ridge analysis is one of the experience-based forensic science disciplines. Practitioners typically compare the impressions left by ridges of the surfaces of the hands and feet (volar surfaces). Finger, palm, and sole prints have been used for identification for well more than a century.<sup>36</sup> They are used as individualization evidence, meaning that they are said to come from one unambiguous source.

Training in friction ridge analysis varies widely from agency to agency, and the techniques used to collect and compare ridges also vary from agency to agency. The International Association for Identification offers training courses<sup>37</sup>, as do some colleges that teach forensic sciences; however, as with other forensic science, there are not established national guidelines regarding education or training prior to employment as a crime scene technician or law enforcement officer who performs friction ridge analysis.<sup>38</sup>

Fingerprint analysis has come into scrutiny in the last decade, and the scientific foundation of the analysis is currently being debated.<sup>39</sup> Without consistent methods of training and evaluation, the reliability of comparisons is being questioned. There is not doubt as to the uniqueness of fingerprints; instead it is the probability of human error that is the problem with fingerprints.<sup>40</sup>

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<sup>36</sup> NAS Report at 43.

<sup>37</sup> *Id.* at 136.

<sup>38</sup> *Id.*

<sup>39</sup> R. Epstein. Fingerprints meet *Daubert*: The myth of fingerprint “science” is revealed. 75 *Southern California Law Review* 605 (2002).

<sup>40</sup> *Id.*

In Maryland in 2007, Judge Susan M. Souder did not allow an analyst to testify in a death row trial.<sup>41</sup> She determined the method of analysis to be “a subjective, untested, unverifiable identification procedure that purports to be infallible.”<sup>42</sup> Other legal challenges highlight the problems facing the latent print methods.<sup>43</sup>

The main problem with friction ridge analysis is that although some Automated Fingerprint Identification Systems (AFIS) permit fully automated identification of fingerprint records related to criminal history, the assessment of latent prints from crime scenes is based largely on human interpretation.<sup>44</sup> The difference is that prints collected from crime scenes have imperfections.

The Report concludes, “at the very least, sufficient documentation is needed to reconstruct the analysis, if necessary.”<sup>45</sup>

i. IMPRESSION EVIDENCE: SHOE PRINTS, TIRE TRACKS, TOOL-MARK AND FIREARM IDENTIFICATION

These disciplines are commonly referred to as “impression evidence.” While shoe and tire prints and tracks are the common impression evidence, other types are: bite marks, marks on bullets/projectiles and cartridge cases, ear prints, lip prints, toolmarks, some types of blood stains, and glove prints.<sup>46</sup>

It has long been believed in the forensic science community that “unique markings are acquired by a source item in random fashion and that such uniqueness is faithfully transmitted

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<sup>41</sup> NAS Report at 43. See State of Maryland v. Bryan Rose. In the Circuit Court for Baltimore County. Case No. K06-545.

<sup>42</sup> *Id.*

<sup>43</sup> New Hampshire vs. Richard Langill, 157 N.H. 77, 945 A.2d 1 (N.H., April 04, 2008). See also, Maryland vs. Bryan Rose, No. K06-0545 (MD Cir. Ct. Oct. 19, 2007).

<sup>44</sup> NAS Report at 139.

<sup>45</sup> *Id.* at 143.

<sup>46</sup> *Id.* at 145, citing M. Liukkonen, H. Majamaa, and J. Virtanen. 1996. The role and duties of the shoeprint/toolmark examiner in forensic laboratories. *Forensic Science International* 82:99-108.

from the source item to the evidence item being examined.”<sup>47</sup> The goal is to determine whether the source item and an impression are individualized due to the pattern of wear or use on the item.

Class characteristics of footwear and tires result from repetitive, controlled processes that are typically mechanical, such as those used to manufacture items in quantity<sup>48</sup>. For tires, a class characteristic is defined as, “[p]hysical characteristics acquired during the manufacturing process (made from the same mold) that tires have in common. Class characteristics can often be combined to limit a tire impression to a very select group within the overall group bearing similar class characteristics. In the field of forensic tire evidence, class characteristics often refer to such things as design, pattern, size, shape, mold variations, etc.”<sup>49</sup>

Tool mark identification is the analysis of microscopic markings left by tools on surfaces. And, firearm identification is the analysis of microscopic markings left by different parts of a gun on bullets/projectiles and casings.<sup>50</sup>

One of the issues with impression evidence stems from the fact that results are not always made public so they can “reviewed, checked by others, criticized, and then revised, and this has not been done for some of the forensic science disciplines.”<sup>51</sup> The Committee noted the 2008 closing of a Detroit Police crime laboratory following a Michigan State Police Audit that discovered a 10% rate of error in ballistic evidence.<sup>52</sup>

The Report stated that much more research into the impression discipline is needed, “there is no consensus about the number of individual characteristics needed to make a positive

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<sup>47</sup> *Id.* at 43.

<sup>48</sup> *Id.* at 146.

<sup>49</sup> *Id.*

<sup>50</sup> *Id.*

<sup>51</sup> P.C. Giannelli. Wrongful convictions and forensic science: The need to regulate crime labs. 86 N.C. L. REV. 163 (2007).

<sup>52</sup> NAS Report at 44.

identification and no data about the variability of class or individual characteristics or about the validity or variability of the method. Without such population studies, it is impossible to assess the number of characteristics that must match in order to have any particular degree of confidence about the source of the impression.”<sup>53</sup>

Because not enough is known about the variabilities between individual impressions, it is not possible to specify how many points of similarity are needed for a given level of confidence in the result.<sup>54</sup>

The Report concluded that class characteristics are helpful in narrowing the pool of tools that may have left the mark, and individual patterns might in some cases point to a particular source, but additional studies need to be performed. A fundamental problem is the lack of a precisely defined process for identification.<sup>55</sup>

## ii. HAIR EVIDENCE

The presumption behind of this discipline is that various characteristics of hairs can be identified and may be sufficiently different that they can be useful in excluding, or including, individuals from a pool of possible sources.<sup>56</sup>

Visual hair analysis (non-DNA) consists of a subjective comparison using a microscope.<sup>57</sup> The results of hair analysis and/or comparison are usually accepted as class evidence.<sup>58</sup> The results should not be used to conclude that a hair came from a particular or individual source.<sup>59</sup>

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<sup>53</sup> Maw at 4.

<sup>54</sup> Nas Report at 154.

<sup>55</sup> *Id.*

<sup>56</sup> Maw at 4.

<sup>57</sup> Maw at 4.

<sup>58</sup> NAS Report at 156.

<sup>59</sup> Maw at 4.

Animal hair analysis can be useful in certain cases. However, animal hair analysis typically only identifies the type of animal, and not the specific breed.<sup>60</sup>

The Committee was concerned about courtroom experiences several members had, “where despite the lack of statistical foundation, hair examiners made problematic claims based upon experience.”<sup>61</sup> There have also been exonerations in which hair comparison evidence was produced in the original trials.

The Report concludes, “no scientifically accepted statistics exist about the frequency with which particular characteristics of hair are distributed in the population. Moreover, there are no uniform standards on the number of features that must agree before a “match” is declared.”<sup>62</sup> The Committee found no scientific support for the use of hair comparisons for individualization in the absence of nuclear DNA.<sup>63</sup>

### iii. FIBER EVIDENCE

Fiber evidence—including synthetic fibers such as nylon, polyester and acrylic as well as botanical fibers such as ramie or jute, which are common in ropes or twines—can be examined microscopically in the same way as hairs, and with the same limitations.<sup>64</sup>

Fibers can also be analyzed using analytical chemistry in order to provide a more solid foundation.<sup>65</sup> However, the Report states that fiber examiners agree that fiber evidence should be used only to associate a given fiber with a class of fibers.<sup>66</sup>

The Report concludes that although guidelines for analysis have been produced, there are no set standards for the number and quality of characteristics that must correspond to establish

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<sup>60</sup> NAS Report at 156.

<sup>61</sup> *Id.* at 160.

<sup>62</sup> *Id.* at 161.

<sup>63</sup> Maw at 5. See also NAS Report at 161.

<sup>64</sup> NAS Report at 161.

<sup>65</sup> *Id.*

<sup>66</sup> *Id.*

that two fibers came from the same manufacturing batch. Moreover, there have been no studies on the guidelines, nor any study to establish reliability or error rates although there would be scope in this field to develop an understanding of the uncertainties involved.<sup>67</sup>

#### iv. QUESTIONED DOCUMENT ANALYSIS

This type of analysis involves the comparison and analysis of “documents and printing and writing instruments in order to identify or eliminate persons as the source of the handwriting; to reveal alterations, additions, or deletions; or to identify or eliminate the source of typewriting or other impression marks.”<sup>68</sup>

Questioned document examination includes the field of handwriting identification. However, forensic document examination does not involve a study of handwriting that purports to create a personality profile or otherwise analyze or judge the writer’s personality or character.<sup>69</sup>

The Report states that recent studies have increased our understanding of the individuality and consistency of handwriting, and suggest that there may be a scientific basis for handwriting comparison.<sup>70</sup> However, there has only been limited research to quantify the reliability and replicability of the practices used.<sup>71</sup> The Report concludes that the “scientific basis for handwriting comparisons needs to be strengthened.”<sup>72</sup>

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<sup>67</sup> Maw at 5. See also NAS Report at 163.

<sup>68</sup> NAS Report at 163.

<sup>69</sup> *Id.* at 164.

<sup>70</sup> *Id.* at 166-7.

<sup>71</sup> *Id.* at 167.

<sup>72</sup> *Id.* at 166.

## v. BLOODSTAIN PATTERN ANALYSIS

Bloodstain evidence is very important in criminal cases. It assists in understanding the events of a crime, and is used in crime scene reconstruction.<sup>73</sup> Bloodstain patterns can give an indication of the type of injury sustained, the movements of the victim and perpetrator, the angle of the weapon's impact, how the blood was dispersed from the body, and more.

Although there are recommended qualifications, the two organizations that have or recommend qualifications are the IAI and the Scientific Working Group on Bloodstain Pattern Analysis (SWGSTAIN).<sup>74</sup> SWGSTAIN's suggested requirements for practicing bloodstain pattern analysis are outwardly impressive, as are IAI's 240 hours of course instruction. But the IAI has no educational requirements for certification in bloodstain pattern analysis.<sup>75</sup>

While there is scientific support for some aspects of bloodstain pattern analysis, the opinions of bloodstain pattern analysts are more subjective than scientific.<sup>76</sup> Conclusions reached by some experts go far beyond what can be supported.<sup>77</sup> The Report also warns that bloodstain analysis tends to be either sharply prosecution driven or defense driven, which may lead to context bias.<sup>78</sup>

The Report concludes "many experiments must be conducted to determine what characteristics of a bloodstain pattern are caused by particular actions during a crime and to inform the interpretation of those causal links and their variabilities."<sup>79</sup> And, that care must be given to the way in which bloodstain pattern analysis is presented in court.<sup>80</sup>

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<sup>73</sup> *Id.* at 177.

<sup>74</sup> *Id.* at 178.

<sup>75</sup> *Id.*

<sup>76</sup> *Id.*

<sup>77</sup> Maw at 7.

<sup>78</sup> *Id.*

<sup>79</sup> NAS Report at 178-9.

<sup>80</sup> *Id.* at 179.

## B. ANALYTICAL EVIDENCE

### i. ANALYSIS OF CONTROLLED SUBSTANCES

The analytical testing methods used to in the analysis of controlled substances were adopted from classical analytical chemistry.<sup>81</sup> Because of the methods strong scientific underpinnings and broad agreement about best practices, the methods are deemed reliable.<sup>82</sup>

The reporting of “terse” results is identified by the Report as a problem, with only the results reported and not the tests that were conducted.<sup>83</sup> The Report determines that from a scientific perspective, this is inadequate, as it may not provide enough detail for courts and attorneys to understand and question the sampling scheme, process of analysis, and interpretation.<sup>84</sup>

### ii. PAINT AND COATING EVIDENCE

Paint is typically transferred from its source to another item when two objects come into contact with each other, and at least one of the objects is painted.<sup>85</sup> Painted surfaces are encountered often at crime scenes, and can be useful in suggesting possible connections of evidence from the crime scene to its source and therefore are helpful in narrowing or excluding possible witnesses and suspects as well as in providing useful information for investigative leads<sup>86</sup>. This is because painted surfaces tend to be repainted over time, providing a characteristic history of paint layer sequences.<sup>87</sup>

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<sup>81</sup> NAS Report at 134.

<sup>82</sup> *Id.*

<sup>83</sup> Maw at 3.

<sup>84</sup> *Id.*

<sup>85</sup> Maw at 5.

<sup>86</sup> NAS Report at 177.

<sup>87</sup> *Id.*

Paint analysts typically have an extensive background in science due to the chemistry involved in analysis.<sup>88</sup> There are set guidelines for interpretation, although there are no set criteria for report wording, or determining criteria, although a range of conclusions may be used to show the significance of the examination results.<sup>89</sup> The Report suggests that work “should be done to provide standard language for reporting conclusions and sources of uncertainty.”<sup>90</sup>

The Report concludes that analysis of paints and coatings is based on a solid foundation of chemistry to enable class identification.<sup>91</sup> And, although some studies show an error rate of lower than 3%, the community has not defined precise criteria for determining whether two samples come from a common source class.<sup>92</sup>

### iii. EXPLOSIVES AND FIRE EVIDENCE AND DEBRIS

Explosives analysis involves identifying the components and construction of an explosive device and an analysis of any unconsumed explosives and residues with the aim of identifying the explosive material used.<sup>93</sup> Examiners usually have an extensive scientific background.<sup>94</sup>

Examiners involved with the analysis of explosives evidence in the laboratory typically have an extensive scientific background, because the methods used entail a large amount of chemistry and instrumentation.<sup>95</sup> Training is more extensive in explosives analysis than in some other areas of forensic science, and proficiency testing is required once per calendar year.<sup>96</sup>

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<sup>88</sup> *Id.* at 168.

<sup>89</sup> *Id.* at 169.

<sup>90</sup> *Id.*

<sup>91</sup> *Id.* at 170.

<sup>92</sup> *Id.*

<sup>93</sup> *Id.*

<sup>94</sup> NAS Report at 170. See also Maw at 6.

<sup>95</sup> NAS Report at 170-1.

<sup>96</sup> NAS Report at 171.

The Report concludes that explosives and fire debris analysis is based primarily on well-established chemistry and as such, has a strong foundation in science.<sup>97</sup>

The examination of fire debris not connected with explosions often aims to determine if a fire started naturally or whether an accelerant was used.<sup>98</sup> And, in relation to fire debris not connected with explosions, much more research is needed on burn patterns and how they are affected by the presence of various accelerants.<sup>99</sup> It notes that some arson investigators make unfounded determinations about whether or not a particular fire was set and the rules of thumb typically assumed have been shown to be untrue.<sup>100</sup>

#### iv. FORENSIC ONDONTOLOGY

This discipline includes the identification of unknown remains and bite mark comparison.<sup>101</sup> The Report notes that the former is well established in the forensic science disciplines.<sup>102</sup> The latter is controversial, although there are guidelines for the collection of evidence from victims and suspects and the techniques used are generally well established and noncontroversial.<sup>103</sup>

Bite marks are typically found in violent cases, and the techniques for obtaining evidence from human skin vary, although they are well established and noncontroversial.<sup>104</sup> While the techniques are not controversial, bite marks on skin will change over time due to the changes in

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<sup>97</sup> *Id.* at 172.

<sup>98</sup> NAS Report at 172.

<sup>99</sup> NAS Report at 173.

<sup>100</sup> NAS Report at 173. See also Maw at 6.

<sup>101</sup> Maw at 6.

<sup>102</sup> *Id.*

<sup>103</sup> *Id.*

<sup>104</sup> NAS Report at 173.

skin.<sup>105</sup> Also, some practical difficulties, such as distortions in photographs and changes over time in the dentition of suspects, may limit the accuracy of the results.<sup>106</sup>

The Report states that, as with other “experience-based” methods, this form of forensic analysis has the potential for bias when evaluating a specific bite mark in a particular criminal case.<sup>107</sup> There can be great pressure on the expert to declare a match.<sup>108</sup>

The Report notes that there has not been a thorough study conducted on large populations to establish the uniqueness of bite marks, and there is no central repository of bite marks and patterns.<sup>109</sup> And, the Committee recommends that more research be conducted to confirm the “fundamental basis for the science of bite mark comparison.”<sup>110</sup>

The Report concludes that the scientific basis of bite marks is insufficient to conclude that bite mark comparisons can result in a conclusive match.<sup>111</sup> However, the process can “sometimes exclude suspects.”<sup>112</sup>

#### v. BIOLOGICAL EVIDENCE

The Committee warns that biological evidence can be more difficult to locate at a crime scene than the layperson presumes.<sup>113</sup> Most biological evidence is not visible to the naked eye (i.e. saliva, semen), and blood does not always appear bright red and visible as movies or television may portray crime scenes.<sup>114</sup>

Alternative light sources and catalytic chemical tests are the most common ways to locate biological evidence at crime scenes (ALS at 415nm wavelength, Luminol, fluorescein, or

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<sup>105</sup> NAS Report at 174.

<sup>106</sup> *Id.*

<sup>107</sup> Maw at 6.

<sup>108</sup> *Id.*

<sup>109</sup> *Id.*

<sup>110</sup> NAS Report at 175.

<sup>111</sup> *Id.*

<sup>112</sup> *Id.* at 176.

<sup>113</sup> NAS Report at 177-8.

<sup>114</sup> *Id.* at 129.

crystal violet).<sup>115</sup> It should be noted that these tests might alert to a false positive, as items other than blood can sometimes be located with them.<sup>116</sup>

More recently, immunological tests that identify human hemoglobin or glycoporphin A; as well as tests for seminal plasma proteins such as prostate specific antigen or semenogelin have become available.<sup>117</sup> Although more expensive, these test conclusively identify blood, as opposed to the older tests which are merely presumptive of blood.<sup>118</sup>

The non-DNA laboratory tests for biological evidence are reliable and well established.<sup>119</sup> However, minus the ability to obtain DNA from a sample, the tests produce class results as opposed to linking the sample to an individual.<sup>120</sup> Biological evidence tests can be used to exclude suspects.

DNA analysis was determined to be valid and reliable in the 1989 in New York in *People v. Castro*.<sup>121</sup> DNA typing is now universally regarded as founded in science and is currently the standard against which other forensic science techniques are judged.<sup>122</sup> DNA typing is very reliable, and absent misconduct or fraud, the probabilities of an error in typing are quantifiable and miniscule.<sup>123</sup>

Laboratories entering the results of forensic DNA testing into CODIS must meet specific quality guidelines, which include the requirement that the laboratory be accredited and that specific procedures be in place and followed. In accredited laboratories, forensic DNA personnel must take proficiency tests and must meet specific educational and training requirements. Laboratory analyses are conducted by scientists with degrees ranging from a bachelor's degree in

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<sup>115</sup> NAS Report at 129.

<sup>116</sup> *Id.*

<sup>117</sup> *id.*

<sup>118</sup> *Id.*

<sup>119</sup> *Id.*

<sup>120</sup> *Id.*

<sup>121</sup> NAS Report at 133.

<sup>122</sup> *Id.* at 130.

<sup>123</sup> W.C. Thompson, F. Taroni, and C.G.G. Aitken. 2003. How the probability of a false positive affects the value of DNA evidence. *Journal of Forensic Sciences* 48(1):47-54.

science to a doctoral degree. Each forensic DNA laboratory has a technical leader, who normally must meet additional experience and educational requirements.<sup>124</sup>

The Committee concluded that DNA analysis is scientifically sound based upon several reasons.<sup>125</sup>

1. Biological explanations for individual-specific findings;
2. The 13 STR loci used to compare DNA samples were specifically chosen because the chance of two people matching on all of them is extremely rare;
3. The probabilities of false positives have been researched and quantified;
4. Laboratory procedures are well specified and subject to validation and proficiency testing; and
5. There are clear and repeatable standards for analysis, interpretation, and reporting.

### III. USE OF THE NAS REPORT IN FLORIDA COURTS

#### A. ADMISSIBILITY IN FLORIDA COURTS

In Florida, authoritative treatises such as the NAS Report of Forensic Science may not be used as independent evidence of the facts or opinions that they contain. The NAS Report can, however, be used on cross-examination to counter an expert's testimony.

There are two main objections to the use of the NAS Report as independent evidence. First is that it lacks the endorsement of an oath, and second is that the author is not available for cross-examination as to the matters contained in the treatise; a right guaranteed by the Sixth Amendment<sup>126</sup>. Confrontation of a witness allows observation of her demeanor and impact by the court and jury, which are important factors in weighing the value of evidence.

Although the NAS Report may not be introduced as independent evidence on direct examination, Florida does permit authoritative treatises such as the NAS Report to be used during cross-examination.

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<sup>124</sup> NAS Report at 132.

<sup>125</sup> *Id.* at 133.

<sup>126</sup> Bullcoming v. New Mexico, slip opinion No. 09-10876. Argued March 2, 2011—Decided June 23, 2011; see also Crawford v. Washington, 124 S.Ct. 1354 (2004).

Cross-examination serves to expose weaknesses and clarify the substance of testimony. The NAS Report may be used to contradict, discredit, or impeach the credibility of an expert by showings that authorities on which the witness relied do not support her testimony. The NAS Report can also be used to attack the witness' qualifications by showing that standard authorities and scientific community disagree with her. Authoritative publications can only be used during the cross-examination of an expert and cannot be used to bolster the credibility of an expert or to supplement an opinion of the expert that has already been formed<sup>127</sup>.

#### B. ENTERING THE NAS REPORT INTO EVIDENCE

There are numerous pertinent sections of the Evidence Code to take into account when introducing the NAS Report into evidence. All relevant sections are listed in the attached Appendix A. The most important sections are discussed herein.

§ 90.401 Definition of relevant evidence: Relevant evidence is evidence tending to prove or disprove a material fact.

The Florida courts have determined that “relevancy describes evidence that has a legitimate tendency to prove or disprove a given proposition that is material as shown by the pleadings. [It is] a tendency to establish a fact in controversy or to render a proposition more or less probable.”<sup>128</sup>

- Generally, a trial court has broad discretion in determining what evidence is relevant, and such determination will only be disturbed in cases of abuse of discretion<sup>129</sup>.
- Expert scientific opinions must be based on techniques that have been “generally accepted” and reliable by the relevant scientific community<sup>130</sup>.

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<sup>127</sup> 31 Am. Jur. Proof of Facts 2d 443

<sup>128</sup> *Zabner v. Howard Johnson's Inc. of Fla.*, 227 So.2d 543, 545 (Fla.4th DCA. 1969).

<sup>129</sup> *Jacobs v. State*, 962 So.2d 934 (4th DCA 2007).

<sup>130</sup> *Olvera v. State*, 641 So.2d 120 (5th DCA 1994).

- Expert testimony is subject to the requirements of relevance and reliability from probative value weighed against prejudice or confusion of the issue, as is all evidence<sup>131</sup>.
- Novel scientific evidence is not admissible unless it meets the test established in *Frye*<sup>132</sup>.
- Questions regarding the admissibility of novel scientific evidence under *Frye* are to be determined in a manner that minimizes the possibility of a wrongful conviction<sup>133</sup>.
- The court may examine scientific writings to assist in determining whether novel scientific evidence meets the “general acceptance” standard of *Frye*<sup>134</sup>.

§ 90.706 Authoritativeness of literature for use in cross examination: Statements of facts or opinions on a subject of science, art, or specialized knowledge contained in a published treatise, periodical, book, dissertation, pamphlet, or other writing may be used in cross-examination of an expert witness if the expert witness recognizes the author or the treatise, periodical, book, dissertation, pamphlet, or other writing to be authoritative, or, notwithstanding non-recognition by the expert witness, if the trial court finds the author or the treatise, periodical, book, dissertation, pamphlet, or other writing to be authoritative and relevant to the subject matter.

- [NAS Report] cannot be used as independent, substantive, or affirmative evidence<sup>135</sup>.
- [NAS Report] cannot be used to bolster the defense expert witnesses<sup>136</sup>.

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<sup>131</sup> Ramirez v. State, 810 So.2d 836 (Fla. 2001).

<sup>132</sup> Bevil v. State, 875 So.2d 1265 (1st DCA 2004).

<sup>133</sup> *Id.*

<sup>134</sup> *Id.*

<sup>135</sup> Rice v. Clement, 184 So.2d 678 (4th DCA 1966).

<sup>136</sup> *Id.*

## APPENDIX A: FLORIDA EVIDENCE CODE AND CASES

### SECTION ONE: RELEVANT TITLES OF THE FLORIDA EVIDENCE CODE (2010)

#### 90.107. Limited admissibility

When evidence that is admissible as to one party or for one purpose, but inadmissible as to another party or for another purpose, is admitted, the court, upon request, shall restrict such evidence to its proper scope and so inform the jury at the time it is admitted.

#### 90.108. Introduction of related writings or recorded statements

(1) When a writing or recorded statement or part thereof is introduced by a party, an adverse party may require him or her at that time to introduce any other part or any other writing or recorded statement that in fairness ought to be considered contemporaneously. An adverse party is not bound by evidence introduced under this section.

(2) The report of a court reporter, when certified to by the court reporter as being a correct transcript of the testimony and proceedings in the case, is prima facie a correct statement of such testimony and proceedings.

#### 90.302. Classification of rebuttable presumptions

Every rebuttable presumption is either:

(1) A presumption affecting the burden of producing evidence and requiring the trier of fact to assume the existence of the presumed fact, unless credible evidence sufficient to sustain a finding of the nonexistence of the presumed fact is introduced, in which event, the existence or nonexistence of the presumed fact shall be determined from the evidence without regard to the presumption; or

(2) A presumption affecting the burden of proof that imposes upon the party against whom it operates the burden of proof concerning the nonexistence of the presumed fact.

#### 90.401. Definition of relevant evidence

Relevant evidence is evidence tending to prove or disprove a material fact.

#### 90.402. Admissibility of relevant evidence

All relevant evidence is admissible, except as provided by law.

#### 90.702. Testimony by experts

If scientific, technical, or other specialized knowledge will assist the trier of fact in understanding the evidence or in determining a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education may testify about it in the form of an opinion; however, the opinion is admissible only if it can be applied to evidence at trial.

#### 90.703. Opinion on ultimate issue

Testimony in the form of an opinion or inference otherwise admissible is not objectionable because it includes an ultimate issue to be decided by the trier of fact.

#### 90.704. Basis of opinion testimony by experts

The facts or data upon which an expert bases an opinion or inference may be those perceived by, or made known to, the expert at or before the trial. If the facts or data are of a type reasonably relied upon by experts in the subject to support the opinion expressed, the facts or data need not be admissible in evidence.

#### 90.705. Disclosure of facts or data underlying expert opinion

(1) Unless otherwise required by the court, an expert may testify in terms of opinion or inferences and give reasons without prior disclosure of the underlying facts or data. On cross-examination the expert shall be required to specify the facts or data.

(2) Prior to the witness giving the opinion, a party against whom the opinion or inference is offered may conduct a voir dire examination of the witness directed to the underlying facts or data for the witness's opinion. If the party establishes prima facie evidence that the expert does not have a sufficient basis for the opinion, the opinions and inferences of the expert are inadmissible unless the party offering the testimony establishes the underlying facts or data.

#### 90.706. Authoritativeness of literature for use in cross-examination

Statements of facts or opinions on a subject of science, art, or specialized knowledge contained in a published treatise, periodical, book, dissertation, pamphlet, or other writing may be used in cross-examination of an expert witness if the expert witness recognizes the author or the treatise, periodical, book, dissertation, pamphlet, or other writing to be authoritative, or, notwithstanding nonrecognition by the expert witness, if the trial court finds the author or the treatise, periodical, book, dissertation, pamphlet, or other writing to be authoritative and relevant to the subject matter.

## SECTION TWO: CASE NOTES AND DECISIONS UNDER § 90.401 DEFINITION OF RELEVANT EVIDENCE

### DISCRETION OF COURT

A trial court's discretion in determining the relevancy of evidence is limited by the rules of evidence and applicable case law ... the determination of relevancy is within the discretion of the trial court; where a trial court has weighed probative value against prejudicial impact before reaching its decision to admit or exclude evidence, an appellate court will not overturn that decision absent a clear abuse of discretion. [Thigpen v. United Parcel Services, Inc., App. 4 Dist., 990 So.2d 639 \(2008\).Evidence 🔑99](#)

Generally, a trial court is granted broad discretion in determining the relevance of evidence and such a determination will not be disturbed absent an abuse of discretion. [Jacobs v. State, App. 4 Dist., 962 So.2d 934 \(2007\)](#), rehearing denied.[Criminal Law 🔑338\(1\)Criminal Law 🔑1153.3](#)

Broad discretion rests with the trial court in matters relating to the admissibility of relevant evidence, and that ruling will not be overturned absent a clear abuse of discretion. [Lavallee v. State, App. 4 Dist., 958 So.2d 509 \(2007\)](#), rehearing denied, review denied [969 So.2d 1015.Criminal Law 🔑338\(1\)Criminal Law 🔑1153.3](#)

A trial court's discretion in determining the relevancy of evidence is limited by the evidence rules. [Deville v. State, App. 4 Dist., 917 So.2d 1058 \(2006\).Criminal Law 🔑338\(1\)](#)

Relevancy determinations are within the trial court's discretion, and depend on the facts. ... trial court did not abuse its discretion in first-degree murder trial by admitting into evidence the result of a Luminol test for the presence of blood near defendant's front door; fact that Luminol could react to substances other than blood went to the weight of the evidence rather than its admissibility, jury was made aware of the limitations of Luminol test, and there was evidence that victim was shot in defendant's home, and that surfaces on which blood would have spattered were removed or cleaned, making result of Luminol test relevant. [Mackerley v. State, App. 4 Dist., 900 So.2d 662 \(2005\)](#), rehearing denied, denial of habeas corpus affirmed [284 Fed.Appx. 736, 2008 WL 2610768](#), certiorari denied [129 S.Ct. 1014, 173 L.Ed.2d 296.Criminal Law 🔑388.2](#)

Trial court's refusal to allow defense witness to testify about her personal drug use and what she thought capital murder defendant would have been going through with respect to his alleged crack cocaine use was not abuse of discretion, in post-conviction relief hearing; testimony would not have been based on witness' personal knowledge, and witness' testimony about her own drug use would not prove or disprove a material fact as to defendant's drug use ... Trial court's refusal to allow defense witness to answer question on direct examination in post-conviction relief hearing in capital murder prosecution was not abuse of discretion; portion of witness' answer reflected his personal knowledge of matter at issue, but witness' continued statement as to what certain individuals had said was nonresponsive to defense counsel's question, it was not claimed to prove or disprove a material fact, and it was irrelevant. [Rivera v. State, 859 So.2d 495 \(2003\)](#), rehearing denied.[Criminal Law 🔑1614](#)

Trial court has broad discretion in determining the relevance of evidence, and such a determination will not be disturbed absent an abuse of discretion. (Per Curiam, with three Justices concurring and two Justices concurring in result.) [Taylor v. State, 855 So.2d 1 \(2003\)](#), rehearing denied, certiorari denied [124 S.Ct. 1605, 541 U.S. 905, 158 L.Ed.2d 248.Criminal Law 🔑338\(1\)Criminal Law 🔑1153.3](#)

Overall, broad discretion rests with the trial court in matters relating to the admissibility of relevant evidence, and that ruling will not be overturned absent a clear abuse of discretion. [Grau v. Branham, App. 4 Dist., 761 So.2d 375 \(2000\)](#), rehearing denied, review denied [789 So.2d 345.Appeal And Error 🔑970\(2\)Evidence 🔑99](#)

Relevancy determinations are within trial court's discretion and absent clear abuse of discretion, such rulings will not be overturned. [Howard v. State, App. 1 Dist., 616 So.2d 484 \(1993\).Criminal Law 🔑338\(1\)Criminal Law 🔑1153.3](#)

Trial court properly refused to allow defense counsel to cross-examine paid informant and key witness for prosecution about informant's testimony before magistrate, where those proceedings were completely unrelated to parties and instant proceedings and occurred after defendants' arrest. [Diaz v. State, App. 1 Dist., 441 So.2d 1125 \(1983\).Witnesses 🔑270\(2\)](#)

## SCIENTIFIC EVIDENCE

Any doubt as to admissibility of novel scientific evidence under *Frye* should be resolved in a manner that minimizes the chance of a wrongful conviction ...

In reaching decision regarding general acceptance of novel scientific evidence under *Frye*, court may examine expert testimony, scientific and legal writings, and judicial opinions ... Novel scientific evidence is not admissible in Florida unless it meets the test established in *Frye*, which requires that such evidence be sufficiently established to have gained general acceptance in the particular field in which it belongs. [Bevil v. State, App. 1 Dist., 875 So.2d 1265 \(2004\)](#), rehearing denied. [Criminal Law](#) 🔑388.1

All evidence, including expert testimony, is subject to the requirements of relevance and legal reliability from probative value weighed against prejudice or confusion of issues. [Ramirez v. State, 810 So.2d 836 \(2001\)](#), rehearing denied.

In order to be admissible, expert scientific opinion must be based on techniques that have been “generally accepted” by the relevant community and found to be reliable. [Olvera v. State, App. 5 Dist., 641 So.2d 120 \(1994\)](#). [Criminal Law](#) 🔑486(2)

Profile testimony must meet *Frye* test, designed to ensure that jury will not be misled by experimental scientific methods which may ultimately prove to be unsound ... Sex offender profile evidence did not meet *Frye* test for admissibility of novel scientific evidence ... Sex offender profile evidence that did not meet *Frye* test for admissibility of novel scientific evidence was not otherwise admissible as background information in sexual battery prosecution. [Flanagan v. State, 625 So.2d 827 \(1993\)](#). [Criminal Law](#) 🔑474.4(1)

## CASE NOTES AND DECISIONS UNDER § 90.706 AUTHORITATIVENESS OF LITERATURE FOR USE IN CROSS-EXAMINATION

### ADMISSIBILITY OF EVIDENCE

Findings from the Asymptomatic Carotid Atherosclerosis Study (ACAS) served to impermissibly bolster the credibility of patient's experts and diminish the credibility of doctor's expert's opinion on the ultimate issue of malpractice case, and thus ACAS was inadmissible at trial. *Donshik v. Sherman, App. 3 Dist., 861 So.2d 53 (2003)*, rehearing and rehearing en banc denied, rehearing denied [870 So.2d 823](#). [Evidence](#) 🔑559 [Evidence](#) 🔑560

Medical books may be introduced in rebuttal to contradict witness who testified to having derived therefrom teachings that they do not contain or which are substantially different from those testified to by the witness. [Rice v. Clement, App. 4 Dist., 184 So.2d 678 \(1966\)](#). [Evidence](#) 🔑560

Medical books cannot be read or introduced before juries as independent, substantive or affirmative proof. [Rice v. Clement, App. 4 Dist., 184 So.2d 678 \(1966\)](#). [Evidence](#) 🔑363

## AUTHORITATIVENESS OF PUBLICATIONS

Trial court properly precluded defendant charged with manslaughter and aggravated child abuse from using article published in medical journal as tool for cross-examination of medical experts, where medical experts acknowledged publication as reputable but refused to recognize particular article as authoritative, and defendant failed to establish authoritativeness of article by other means. [Whitfield v. State, App. 1 Dist., 859 So.2d 529 \(2003\)](#), rehearing denied, review denied [870 So.2d 824.Criminal Law](#) 🔑487

Trial court committed reversible error in allowing expert witness in medical malpractice action to be cross-examined through use of medical treatise which had not been deemed authoritative by either expert or court; error could not be considered harmless, as expert testimony was focal point of trial and any attack on experts was thus extremely important. [Myron By and Through Brock v. Doctors General Hosp., Ltd., App. 4 Dist., 704 So.2d 1083 \(1997\)](#), rehearing and rehearing en banc denied, review denied [718 So.2d 167](#), appeal after new trial [818 So.2d 666.Appeal And Error](#) 🔑1048(6)[Evidence](#) 🔑558(11)

It was reversible error to permit defense attorney in medical malpractice action to read portions of medical text in presence of jury while plaintiffs' expert witness was under cross-examination where witness was unfamiliar with portions read, although he had authored another chapter in book about a different subject matter, witness did not recognize text as being authoritative, and defendant failed to establish independently authoritativeness of author or text. [Brown v. Crane, Phillips, Thomas & Metts, P.A., App. 2 Dist., 585 So.2d 947 \(1991\).Appeal And Error](#) 🔑1048(6)[Evidence](#) 🔑558(11)

Use of text identified by two expert witnesses as authoritative work on subject of gymnastics in cross-examination of director and head coach of defendant city's recreational program, the author of which was recognized by witness as authority in field, was not reversible error. [City of St. Petersburg v. Ferguson, App. 2 Dist., 193 So.2d 648 \(1966\)](#), certiorari denied [201 So.2d 556.Appeal And Error](#) 🔑1048(6)

## BURDEN OF PROOF

Defendant met burden of showing that technical bulletins and committee opinions published by professional association were authoritative, for purposes of cross-examining plaintiffs' experts in medical malpractice action, though cross-examined experts did not acknowledge authoritativeness of materials themselves, where two of defendant's experts stated in affidavits that they considered those materials authoritative. [Kirkpatrick v. Wolford, App. 5 Dist., 704 So.2d 708 \(1998\).Evidence](#) 🔑558(11)

Determination that medical text is authoritative, such that it may be used to cross-examine experts in malpractice action, need only be supported by some credible evidence, rather than by preponderance of evidence. [Kirkpatrick v. Wolford, App. 5 Dist., 704 So.2d 708 \(1998\).Evidence](#) 🔑558(11)

## PROFFER OF WRITING

Orthodontist's failure to make proffer of article he wished to use to cross-examine patient's expert or of testimony establishing predicate of authoritative nature waived orthodontist's right to appellate review of trial court's alleged error of refusing to allow use of article for cross-examination unless expert was familiar with it. [Fravel v. Haughey, App. 5 Dist., 727 So.2d 1033 \(1999\).Appeal And Error](#) 🔑206.2

## REVIEW

There was no error in granting new trial in medical malpractice action in view of fact that improper evidence was admitted on crucial issue of liability when counsel for the Florida patients' compensation fund, codefendant with hospital in action, improperly attempted, during cross-examination of hospital's expert witness, to bolster opinion of witness by use of a medical treatise. [Tallahassee Memorial Regional Medical Center v. Mitchell, App. 1 Dist., 407 So.2d 601 \(1981\).New Trial](#) 🔑35

## TREATISES

A treatise is inadmissible hearsay, and when the expert's testimony acts as a conduit for such, the opposing party cannot cross-examine and impeach the source of the hearsay. [In re S.E., App. 2 Dist., 946 So.2d 620 \(2007\).Evidence](#) 🔑318(6)[Evidence](#) 🔑556

## USE OF PUBLICATIONS

Authoritative publications can only be used during the cross-examination of an expert and cannot be used to bolster the credibility of an expert or to supplement an opinion of the expert that has already been formed. [Phillip Morris, Inc. v. Janoff, App. 3 Dist., 901 So.2d 141 \(2004\), rehearing and rehearing en banc denied, review denied](#) [915 So.2d 1196.Evidence](#) 🔑556[Evidence](#) 🔑558(11)

Permitting defense counsel on direct examination to use medical journal article to bolster defense expert's testimony that plaintiff in automobile negligence action had not suffered permanent injury was error; applicable statute permitted such use of authoritative publications only on cross-examination and not for purposes of bolstering expert's credibility or supplementing his opinion. [Erwin v. Todd, App. 5 Dist., 699 So.2d 275, 22 Fla. L. Weekly D2016 \(1997\).Evidence](#) 🔑556

Experts cannot, on direct examination, bolster their testimony by testifying that treatise agrees with their opinion, and statements in treatise are not admissible during direct examination of expert, although they can be used on cross-examination. [Schwarz v. State, App. 4 Dist., 695 So.2d 452 \(1997\), rehearing denied, denial of post-conviction relief affirmed](#) [717 So.2d 567.Criminal Law](#) 🔑486(4)

Authoritative publications can only be used during cross-examination of expert and not to bolster credibility of expert or to supplement opinion of doctor which has already been formed. [Green v. Goldberg, App. 4 Dist., 630 So.2d 606 \(1993\).Evidence](#) 🔑558(11)

Learned treatise may not be used as substantive evidence, even though statute authorizes use of authoritative publications to cross-examine expert witnesses; treatise is hearsay if used as substantive evidence. [Green v. Goldberg, App. 4 Dist., 630 So.2d 606 \(1993\).Evidence](#) 🔑 [558\(11\)](#)

Textual material from medical treatise could not be read by motorist's attorney to motorist's expert witness or used by expert witness to bolster his own opinion testimony during direct examination in negligence action. [Chorzelewski v. Drucker, App. 4 Dist., 546 So.2d 1118 \(1989\).Evidence](#) 🔑 [556Evidence](#) 🔑 [559](#)

Medical treatises cannot be used to bolster testimony of physician on direct examination. [Medina v. Variety Children's Hosp., App. 3 Dist., 438 So.2d 138 \(1983\).Evidence](#) 🔑 [559](#)

Authoritative work cannot be introduced as independent evidence, but expert witness may be cross-examined as to authoritative works on subject to which he has testified. [City of St. Petersburg v. Ferguson, App. 2 Dist., 193 So.2d 648 \(1966\)](#), certiorari denied [201 So.2d 556.Evidence](#) 🔑 [363Evidence](#) 🔑 [558\(11\)](#)

## WITNESS TESTIMONY

An expert witness cannot bolster his or her testimony by testifying that a particular treatise supports an opinion. [In re S.E., App. 2 Dist., 946 So.2d 620 \(2007\).Evidence](#) 🔑 [556](#)

Expert testimony proffered by father, in which doctor opined that he did not believe shaken baby syndrome could cause brain injury, was improperly bolstered by the contents of medical journal articles that were inadmissible hearsay, and thus, the expert's testimony was also inadmissible in proceedings to terminate parental rights following child's brain injuries; the Department of Children and Family Services was unable to cross-examine the authors of the articles regarding their qualifications or any aspect of their studies. [In re S.E., App. 2 Dist., 946 So.2d 620 \(2007\).Infants](#) 🔑 [173.1](#)

Error in allowing tobacco companies to improperly bolster expert witness's credibility by listing authoritative sources on re-direct examination was fundamental, and thus required new trial in action by flight attendant against companies for damages caused by environmental tobacco smoke; trial court characterized trial as "battle of expert witnesses," experts agreed that flight attendant suffered from chronic sinusitis and only disagreed as to its cause, and purpose of listing sources was solely to bolster expert's opinion by showing that his opinion was supported by the lack of articles stating otherwise. [Phillip Morris, Inc. v. Janoff, App. 3 Dist., 901 So.2d 141 \(2004\)](#), rehearing and rehearing en banc denied, review denied [915 So.2d 1196.Appeal And Error](#) 🔑 [1048\(7\)](#)

Question by flight attendant's counsel in action against tobacco companies for damages caused by environmental tobacco smoke, in which counsel asked expert whether he agreed with certain web site's information regarding smoke and chronic sinusitis, did not invite companies' error in bolstering expert's credibility by listing by name authoritative texts that lacked articles referring to smoke and chronic sinusitis; expert did not identify any publication but merely responded that

he interpreted the information differently because “it's never been shown in any medical literature.” Tobacco companies impermissibly bolstered expert's testimony in flight attendant's action based on exposure to environmental tobacco smoke by identifying specific authoritative publications and asking whether they lacked articles stating that exposure to environmental tobacco smoke causes chronic sinusitis in an effort to bolster expert's credibility on re-direct examination. [Phillip Morris, Inc. v. Janoff, App. 3 Dist., 901 So.2d 141 \(2004\)](#), rehearing and rehearing en banc denied, review denied [915 So.2d 1196](#). [Appeal And Error](#) 🔑 [882\(9\)](#)

Reference made by doctor's expert witness to undisclosed authoritative source to bolster witness's opinion concerning mortality rate of patients with Type A aortic dissection constituted improper bolstering of witness's opinion and thus was not admissible in medical-malpractice action; source was not revealed during expert witness's deposition, and it was immaterial that reference was made during cross-examination as opposed to direct examination. [Hargrove v. Howell, App. 1 Dist., 884 So.2d 960 \(2004\)](#), rehearing denied, review denied [884 So.2d 22](#). [Pretrial Procedure](#) 🔑 [224](#) [Witnesses](#) 🔑 [318](#)

Defendants' experts in medical malpractice action could not bolster their testimony on direct examination by testifying that bulletins published by national health organization agreed with their opinion as to proper standard of care, nor could defendant physician testify that bulletins supported standard of care he provided patient; authoritative publications could only be used during cross-examination of an expert witness. Experts cannot, on direct examination, bolster their testimony by testifying that a treatise agrees with their opinion. [Liberatore v. Kaufman, App. 4 Dist., 835 So.2d 404 \(2003\)](#), review denied [857 So.2d 198](#). [Evidence](#) 🔑 [363](#) [Evidence](#) 🔑 [556](#)

If expert fails to recognize author or writing proffered as authoritative text, trial court must give party proffering article an opportunity to establish that writing is authoritative through the testimony of other witnesses. [Fravel v. Haughey, App. 5 Dist., 727 So.2d 1033 \(1999\)](#). [Evidence](#) 🔑 [556](#)

Physician's testimony that he did not rely “100 percent” on any particular medical writing, treatise or piece of medical literature to support his treatment of patient could not be impeached on cross-examination by testing such testimony against excerpts from medical books. [Rice v. Clement, App. 4 Dist., 184 So.2d 678 \(1966\)](#). [Witnesses](#) 🔑 [406](#)

## APPENDIX B: NATIONAL CASES REFERENCING THE NAS REPORT

*Last updated July 24, 2011*

### CONFRONTATION CLAUSE

1. *Melendez-Diaz v. Massachusetts*, 129 S. Ct. 2527 (2009)(defendant's right to confront and cross-examine the State's expert witnesses)(Discussing pressure that may lead to bias)

*Justice Scalia*, held that:

1 analysts' certificates of analysis were affidavits within core class of testimonial statements covered by Confrontation Clause, abrogating *Commonwealth v. Verde*, 444 Mass. 279, 827 N.E.2d 701;

2 analysts were not removed from coverage of Confrontation Clause on theory that they were not "accusatory" witnesses;

3 analysts were not removed from coverage of Confrontation Clause on theory that they were not conventional witnesses;

4 analysts were not removed from coverage of Confrontation Clause on theory that their testimony consisted of neutral, scientific testing;

5 certificates of analysis were not removed from coverage of Confrontation Clause on theory that they were akin to official and business records; and

6 defendant's ability to subpoena analysts did not obviate state's obligation to produce analysts for cross-examination.

2. *Bullcoming v. New Mexico*, 131 S. Ct. 2705, 2708 (2011)(Introduction of blood-alcohol analysis report through testimony of non-testing, non-certifying analyst violated Confrontation Clause)Surrogate testimony of the kind Razatos was equipped to give could not convey what Caylor knew or observed about the events he certified, nor expose any lapses or lies on Caylor's part.

### SUCCESSFUL APPEAL

3. *United States v. Hebshie*, 754 F. Supp. 2d 89 (D. Mass. 2010)(defense counsel's performance was deficient in failing to move for *Daubert* hearing on any expert testimony; counsel's performance was deficient in failing to challenge canine evidence; counsel's performance was deficient in failing to request hearing on laboratory test; counsel's performance was deficient in failing to request hearing on cause-and-origin evidence; and counsel's deficient performance prejudiced defendant.)

### UNSUCCESSFUL APPEAL

4. *Molina v. State*, M2010-00447-CCA-R3PC, 2011 WL 1344287 (Tenn. Crim. App. Apr. 8, 2011)(claim of unreliable fingerprint comparison evidence is not a cognizable ground for post-conviction relief.)
5. *Ex Parte Robbins*, AP-76,464, 2011 WL 2555665 (Tex. Crim. App. June 29, 2011)(Quoting NAS regarding disconnect between evolving science and finality of law: newly available evidence of medical examiner's re-evaluation of her trial opinion did not unquestionably establish defendant's innocence, and medical examiner's trial testimony was not false and did not create a false impression, and thus the State did not use false evidence to obtain defendant's conviction and defendant did not have a due process right to have a jury hear medical examiner's re-evaluation of the evidence.)

#### SUCCESSFUL DEFENSE MOTIONS TO EXCLUDE EVIDENCE/TESTIMONY

6. *United States v. Smallwood*, No. 5:08-CR-38, 2010 WL 4168823 (W.D. Ky. Oct. 12, 2010) (excluding testimony on tool mark identification involving marks left by a knife)
7. *State v. Ward*, 694 S.E.2d 738 (N.C. 2010) (excluding testimony on “visual inspection methodology” employed to identify illicit pharmaceuticals)(Approach employed by expert to identify controlled substances, in which he identified substances based on visual examination, was not sufficiently reliable.)

#### UNSUCCESSFUL ATTEMPTS BY DEFENSE TO USE NAS REPORT AS “NEW EVIDENCE”

8. *Hooper v. Warden*, Civil No. 08-cv-426-JD, 2010 WL 1233968 (D. N.H. Mar. 23, 2010) (NAS Report’s findings on fingerprint and boot print analysis not new, based on existing literature)
9. *Johnston v. State*, 27 So.3d 11 (Fla. 2010) (NAS Report’s findings on blood spatter evidence, luminol testing, fingerprint and footwear analysis not new, based on existing literature)(Death Penalty. Report issued by forensic science committee did not constitute newly discovered evidence warranting new trial for capital defendant.)

#### CONCERNS ABOUT METHODOLOGY ARE PROPERLY A SUBJECT FOR CROSS-EXAMINATION

10. *United States v. Aman*, No. 1:10cr236, 2010 WL 4103157 (D. Va. Oct. 18, 2010) (arson investigation)(Testimony of fire investigator, fingerprint specialist, and forensic scientist were admissible in arson prosecution.)
11. *United States v. Cerna*, No. CR 08-0730 WHA, 2010 WL 3448528 (N.D. Cal. Sept. 1, 2010) (AFTE theory and ACE-V method)(AFTE theory and the ACE-V method, if properly applied, are sufficiently reliable under *Daubert*.)

#### EVIDENCE/TESTIMONY ALLOWED

12. *Fleming v. State*, No. 899, 2010 WL 3063228 (Md. Ct. Spec. App. Aug. 4, 2010) (tool mark identification accepted within scientific community and admissible)(Traditional comparative microscopy remained a generally accepted methodology for firearm tool mark identification.)

13. *United States v. Montalvo-Rangel*, No. SA-10-CR-64, 2010 WL 1484708 (W.D. Tex. Apr. 13, 2010) (fingerprint analysis)
14. *Commonwealth v. Vasquez*, 923 N.E.2d 524 (Mass. 2010) (drug identification)(Admission of drug certificates in violation of confrontation clause was not harmless error.)
15. *State v. Hull*, 788 N.W.2d 91 (Minn. 2010) (but see Justice Meyer’s concurring opinion) (fingerprint and handwriting analysis)(extensive evidence besides the fingerprint and handwriting experts' testimony established that Hull was the author of the plan, note, and check.)
16. *United States v. Rose*, 672 F.Supp.2d 723 (D. Md. 2009) (Evidence. Fingerprint identification evidence based on the “ACE✓V” methodology was admissible.)
17. *State v. Lopez-Martinez*, No. 100,643, 2010 WL 2545626 (Kan. Ct. App. June 11, 2010) (court admitted bite mark comparison, but concurrence cited NAS Report’s findings on bite marks in arguing that state supreme court should revisit its decision admitting bite mark comparison)
18. *Com. v. Pytou Heang*, 458 Mass. 827 (2011) (forensic ballistics testimony was sufficiently reliable; gunshot residue evidence was relevant and its probative value was not substantially outweighed by risk of prejudice)
19. *State v. Adams*, COA10-1363, 2011 WL 1938270 (N.C. Ct. App. May 17, 2011)(Precedent, in conjunction with the trial court's factual findings, demonstrate the trial court did not abuse its discretion in allowing AFTE testimony/evidence.)
20. *United States v. Love*, 10CR2418-MMM, 2011 WL 2173644 (S.D. Cal. June 1, 2011)(The court recognizes that the NAS Report and other publications cited by Love critique some aspects of latent fingerprint analysis. However, the forensic science community generally and the FBI in particular have begun to take appropriate steps to respond to that criticism. On this record, in part because of recent developments regarding testing, publication, error rates, and the FBI's governing standards, none of the seven factors discussed by the parties weighs against the admission of latent fingerprint evidence.)

#### EVIDENCE/TESTIMONY ALLOWED BUT RESTRICTED

21. *Commonwealth v. Gambora*, 933 N.E.2d 50 (Mass. 2010) (evidence did not make absolute claims, expert did not say error-free, and cross-examination emphasized that point)(latent print identification theory and ACE-V method)(Latent fingerprint analysis utilized by law enforcement in matching fingerprints found on door to defendant was not scientifically unreliable.)
22. *United States v. Willock*, 696 F. Supp. 2d 536 (D. Md. 2010) (restriction on characterization of certainty warranted; district judge’s opinion adopts Magistrate Grimm’s Report and Recommendation in *United States v. Mouzone*, who was one of Willock’s co-defendants) (tool mark identification)
23. *United States v. Taylor*, 663 F. Supp. 2d 1170 (D. N.M. 2009) (evidence should not be given as matter of scientific certainty) (firearms identification testimony was sufficiently reliable to be admissible as expert testimony.)

24. *Commonwealth v. Fernandez*, 934 N.E.2d 810 (Mass. 2010) (trial court's decision to allow evidence for narrow purpose of showing presumptive and not conclusive testing results upheld)
25. *United States v. Glynn*, 578 F. Supp. 2d 567 (S.D.N.Y. 2008)(ballistics expert would be limited to opining only that a firearms match was "more likely than not".)
26. *State v. McGuire*, 419 N.J. Super. 88 (N.J. Super. Ct. App. Div. 2011)(plastic bag expert's testimony regarding matching garbage bags was admissible; tool mark analyst's expert opinion regarding cliffs on garbage bag was not inadmissible hearsay.)

#### NAS REPORT AS SUPPORTIVE OF FORENSIC METHOD USED

27. *United States v. Zajac*, No. 2:06-cr-00811 CW, 2010 WL 3489672 (D. Utah Sept. 2, 2010) (citing NAS Report's findings on paint and coatings analysis in case where expert identified adhesives)(Expert could not opine that adhesives used in bomb could have come from same sources as those found at defendant's residence.)
28. *State v. Lopez-Martinez*, 100,643, 2010 WL 2545626 (Kan. Ct. App. June 11, 2010) ("[d]espite the inherent weaknesses involved in bite mark comparison, it is reasonable to assume that the process can sometimes reliably exclude suspects."-- And that's just the way the bite-mark evidence was used in our case. The defendant told officers that he had received the bite mark during a wrestling match with a relative, Isabel Curiel–Hernandez. But Dr. Ronald Gier, the dentist who testified, told the jury that the bite mark could *not* have been made by Curiel–Hernandez. Dr. Gier testified that it was "possible" that the bite mark was made by the victim.)

#### OTHER REFERENCES

29. *United States v. Mood*, No. 08-20330, 2010 WL 3000060 (E.D. Mich. July 30, 2010) (citing Judge Gertner's standing order)
30. *United States v. Boyd*, 686 F. Supp. 2d 382 (S.D.N.Y. 2010) (noting that DNA analysis "is not immune from error or falsification")( Confrontation. Allowing DNA expert to testify to results of preliminary testing did not contravene defendant's right to confrontation.)
31. *People v. Carreira*, 893 N.Y.S.2d 844 (City Ct., City of Watertown, NY 2010) (confrontation case quoting portion of *Melendez-Diaz* that cited NAS Report)(Testing records for breath test device were testimonial, and thus inadmissible in DWI case without preparers' live testimony.)
32. *United States v. Prokupek*, No. 8:08CR183, 2009 WL 2634446 (D. Neb. Aug. 14, 2009) (trial court did not admit executive summary of NAS Report because not properly authenticated)
33. *Thomas v. Allen*, 614 F.Supp.2d 1257 (N.D. Ala. 2009) (citing report for general proposition about scientific method)
34. *Commonwealth v. Barbosa*, 933 N.E.2d 93 (Mass. 2010) (generally refers to NAS Report's findings on DNA analysis)(Admission of expert opinion based on non-testifying analyst's DNA testing did not violate the Confrontation Clause.)