National Commission on Forensic Science

Reflecting Back—
Looking Toward the Future

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In 2013, the National Commission on Forensic Science[1] (NCFS or Commission) was created as a Federal Advisory Committee to the U.S. Department of Justice (DOJ) as part of a memorandum of understanding between DOJ and the National Institute of Standards and Technology (NIST).[2] NCFS serves a critical function because it—like no other existing entity—represents the broadest range of interests involved in, affected by, or able to improve forensic evidence: Forensic Science Service Providers (FSSPs), prosecutors, defense counsel, victim advocates, judges, law enforcement, academics, and members of the broader scientific community. NCFS has also provided a forum for a wide variety of stakeholders to participate and comment in the process, as well as spurring discussion at the state and local levels.

The Commission provides recommendations and advice to the Attorney General of the United States and is able to express views for forensic policy considerations at the Federal level. Its work should ultimately affect forensic science policy for state and local law enforcement, prosecutors, and FSSPs, as forensic analysis in the United States largely occurs at the state and local level. One of the most valuable results from the creation of the Commission has been to move the discussion of these critical issues in forensic science out of the silos in particular disciplines and professional groups and allow discussion with the broader scientific community as well as the public. The NCFS has created a forum where all stakeholders in an adversarial legal system to can come together, establish common ground, and find solutions for policy recommendations to strengthen the criminal justice system. The Commission's work is now part of the national discussion surrounding forensic science at the Federal, state and local levels. Since its inception, the Commission has been able to move the path toward forensic reform in a number of ways that have been talked about and worked on by a variety of professional organizations, technical working groups, and state and local agencies for decades. Its work is discussed in detail below, but a few examples of its impact are appropriate here.

- Grant funding has been made available to support further research opportunities and promulgate quality assurance programs. DOJ's National Institute of Justice (NIJ) and Bureau of Justice Assistance (BJA) redrafted grant solicitations for the Paul Coverdell Forensic Science Improvement Grants Program[3] and the Edward Byrne Memorial Justice Assistance Grant (JAG) Program[4] to support accreditation activities and encourage applicants to review NCFS recommendations when developing grant proposals.
- NIJ also introduced opportunities to fund postdoctoral fellowships to foster collaboration between emerging forensic science researchers and forensic science laboratories.[5]
- On the state and local level, crime lab directors have proactively adopted and implemented some of the recommendations in their own laboratories.

[1] U.S. Department of Justice. (n.d.) National Commission on Forensic Science home page. See: https://www.justice.gov/ncfs

[2] This memorandum of understanding (MOU) also created the Organization for Scientific Area Committees (OSAC), which focuses on improving forensic science practice through supporting documentary standards development; the Commission is focused more toward policy issues. The MOU can be found at: https://www.justice.gov/ncfs/file/761051/download

[3] National Institute of Justice's grant solicitation, *Paul Coverdell Forensic Science Improvement Grants Program.* Retrieved from: https://nij.gov/funding/Documents/solicitations/NIJ-2016-8974.pdf

[4] Bureau of Justice Assistance's grant solicitation, *Edward Byrne Memorial Justice Assistance Grant (JAG) Program*. Retrieved from: https://www.bja.gov/funding/JAGLocal16.pdf

[5] National Institute of Justice's grant solicitation, *Research and Evaluation for the Testing and Interpretation of Physical Evidence in Publicly Funded Forensic Laboratories*. Retrieved from: https://nij.gov/funding/Documents/solicitations/NIJ-2016-9011.pdf

- As a result of recommendations by the Commission, DOJ has committed to changes in their discovery practices and adopted a new code of professional conduct for those working in Federal DOJ laboratories.[6,7]
- Although DOJ does not conduct its own medicolegal death investigation (MDI) activities, which predominantly occur at the state and local level, DOJ coordinated with the Office of Science and Technology Policy to convene an interagency working group to examine MDI recommendations. As a result, this National Science and Technology Council MDI interagency working group published a report in December 2016, *Strengthening the Medicolegal-Death Investigation-System: Accreditation and Certification—A Path Forward.*[8] NIJ also announced the first Federal grant program specifically dedicated to strengthening the MDI system by supporting forensic pathology fellowships and offering resources necessary to achieve accreditation for medical examiner and coroner offices[9].

As the second term of the Commission's Charter comes to a close in April 2017, this document reflects on work that has been accomplished and highlights issues that those involved in the Commission did not have time to address during the Commission's first two terms.

The first section briefly describes the Commission's structure, including the Charter, membership, subcommittees, and work products organized in three key categories: Foundational, Operational, and Relational. The second section describes work that the Commission believes needs to be addressed going forward.

I. A LOOK BACK

> ***In his 1963 Letter from Birmingham Jail, Rev. Martin Luther King, Jr., reminded us that "Injustice anywhere is a threat to justice everywhere." Isn't this the point? We are not talking about good science merely for its own sake. We are talking about the need for good science in order to serve justice. And when justice is done, our society as a whole is better for it. I sincerely hope that the work of this Commission will push us closer to this goal.*** —Judge Harry Edwards[10]

It was with these words that Judge Harry Edwards ended his speech, *Reflections on the Findings of the National Academy of Sciences Committee on Identifying the Needs of the Forensic Science Community*, at the first NCFS meeting on February 3, 2014, passing the torch in forensic reform from the National Academy of Sciences (NAS) to the Commission. For the ensuing 3 years, this Federal Advisory

[6] Attorney General Memorandum on Recommendations of the NCFS; Announcement for NCFS Meeting Twelve. Retrieved from: https://www.justice.gov/ncfs/page/file/930411/download

[7] Justice Department Announces New Steps to Advance and Strengthen Forensic Science. Retrieved from: https://www.justice.gov/opa/pr/justice-department-announces-new-steps-advance-and-strengthen-forensic-science

[8] National Science and Technology Council interagency working group, *Strengthening the Medicolegal-Death Investigation-System: Accreditation and Certification—A Path Forward.* Retrieved from: https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/mdi_wg_-_accreditation_and_certification_white_paper_1.6.pdf

[9] National Institute of Justice's grant solicitation, *Strengthening the Medical Examiner-Coroner System Program.* Retrieved from: https://nij.gov/funding/Documents/solicitations/NIJ-2017-11566.pdf

[10] U.S. Department of Justice. (n.d.) National Commission on Forensic Science, Meeting One, *National Academy of Sciences Report Executive Summary.* Retrieved from: https://www.justice.gov/sites/default/files/ncfs/legacy/2014/05/13/harry-edwards.pdf

Committee[11] responded to NAS's call to strengthen forensic science with concrete recommendations and views to assure justice is served by good science.

The NCFS Charter

The Commission's mission is to "enhance the practice and improve the reliability of forensic science."[12] The Commission's Charter[13] outlines the objectives and scope of activities, as well as a description of duties to achieve its mission.

Objectives and Scope of Activities

The objectives and scope directed the Commission to provide recommendations and advice to DOJ concerning national methods and strategies for the following:

1. Strengthening the validity and reliability of the forensic sciences (including medicolegal death investigation);
2. Enhancing quality assurance and quality control in forensic science laboratories and units;
3. Identifying and recommending scientific guidance and protocols for evidence seizure, testing, analysis, and reporting by forensic science laboratories and units; and
4. Identifying and assessing other needs of the forensic science communities to strengthen their disciplines and meet the increasing demands generated by the criminal and civil justice systems at all levels of government.[14]

Description of Duties

These objectives were subdivided into six categories in the Charter's description of duties.

A. To recommend priorities for standards development to the Attorney General;
B. To review and recommend that the Attorney General endorse guidance identified or developed by subject-matter experts;
C. To develop proposed guidance concerning the intersection of forensic science and the courtroom;
D. To develop policy recommendations, including a uniform code of professional responsibility and minimum requirements for training, accreditation and/or certification;
E. To consider the recommendations of the National Science and Technology Council's Subcommittee on Forensic Science; and
F. To identify and assess the current and future needs of the forensic sciences to strengthen their disciplines and meet growing demands.[15]

[11] United States General Services Administration, Federal Advisory Committee Act. Retrieved from https://www.gsa.gov/portal/content/100916

[12] U.S. Department of Justice. (n.d.) National Commission on Forensic Science home page. Retrieved from: https://www.justice.gov/ncfs

[13] U.S. Department of Justice. (n.d.) National Commission on Forensic Science, *Charter, U.S. Department of Justice, National Commission on Forensic Science*. Retrieved from: https://www.justice.gov/ncfs/file/624216/download

[14] Ibid.

[15] Ibid.

Commission Membership and Subcommittees

The makeup of the Commission is unique. It was designed to bring the stakeholders in forensic science and the judicial system together with those in the broader scientific community to discuss and make recommendations in important policy matters. The Commission brought experience from forensic practitioners, scientists, lawyers, and judges as well as advocacy groups. DOJ and NIST gave careful consideration to geographic diversity, subject-matter expertise, and relevant experience from Federal and state jurisdictions in the selection of the 40 Commission members who serve on the Commission.[16] The Commission developed subcommittees whose members draft recommendations and views focusing on their specific target areas: Interim Solutions, Accreditation and Proficiency Testing, Human Factors, Medicolegal Death Investigation, Reporting and Testimony, Training on Science and the Law, and Scientific Inquiry and Research.[17] In addition to allowing the exchange of ideas among Commissioners, the subcommittees also create a robust system for public engagement.

Although the Commission's Charter states that its objectives and scope of activities are to advise DOJ on forensic issues, the Charter also directs the Commission to identify and assess the needs of the forensic science communities, as outlined above in Objective 4. Given the foundational diversity of the Commission itself and the fact that the vast majority of forensic-related analysis litigation occurs in state and local jurisdictions, all Commission work has been constructed with the hope of providing leadership from the Federal government and guidance to "enhance the practice and improve the reliability of forensic science" in all jurisdictions throughout the United States.[18]

To that end, the Commission itself is populated with at least one member of each of the following categories: state prosecutors, defense counsel, judges, law enforcement officials, and lab analysts. Subcommittees provide an even greater diversity to the Commission's work. All proposals are discussed and evaluated on their potential impact on state and local practices. State and local stakeholders have also been active participants in submitting comments on all Commission recommendations and views.

In addition to those who served as Commissioners and on subcommittees, participation by the public has been an integral part of the Commission's work. All Commission meetings are open to the public and are documented with recordings and materials available on the website. All work products were subject to a thirty day public comment period and all public comments were addressed as part of the adjudication process.[19]

Over 600 written public comments were received during the open public comment periods for the 45 work products introduced by the Commission. In addition, over 30 comments were provided in response to NCFS work products and activities during the oral public comment periods at the quarterly Commission meetings. Of these comments, the adopted work products receiving the greatest number of comments were the Recommendation on Accreditation of Digital and Multimedia Evidence Forensic Science Service Providers (over 90 comments), the Recommendation on Pretrial Discovery (over 50 comments), and the Recommendation on a National Code of Professional Responsibility for Forensic Science and Forensic Medicine Service Providers (over 45 comments).[20]

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[16] See Appendix A for the Commissioner biographies.

[17] For more information about the structure of NCFS, see Appendix B for the subcommittee descriptions and membership.

[18] This broader mission is evidenced by the inclusion of medicolegal death investigation (MDI), which occurs almost exclusively outside of the Federal system.

[19] NCFS operational documents: Process for the Development of Work Products; Guidance for the Adjudication of Public Comments. Retrieved from: https://www.justice.gov/ncfs/operational-documents

[20] See Appendix D for public comments submitted to NCFS.

As Dr. Patrick D. Gallagher, then NIST Director and Commission Co-Chair, noted at the first Commission meeting, the work of the Commission has been like "building a plane in midair." The structure, process, members, and subject-matter focus have evolved since that first meeting. Changes included expansion of the Commission's review to include digital evidence, creation of a more formalized process for the review and adoption of work products, revision of the Commission bylaws, and addition or deletion of certain subcommittees.

Work Products

The Commission has adopted 43 work products as of Meeting #12 in January 2017: 20 Recommendation documents and 23 Views documents. Recommendation documents propose specific requests to the Attorney General and describe actions for consideration and implementation within the Federal system. Views documents represent the collective views of the Commissioners and do not request specific action by the Attorney General. Views documents are designed to comment generally on particular subjects and serve as guidance for all forensic and criminal justice communities, whether Federal, state, or local. A complete list of the Commission's work products can be found in Appendix C, and the work product documents can be downloaded from the Commission's website.[21]

The Commission focused and prioritized its work in large part on the four objectives outlined in the Charter (see list above). As the Commission was building on the work of other national discussions and initiatives, recommendations made by the National Science and Technology Council's Subcommittee on Forensic Science were also reviewed. All work products can be grouped into three broad categories: Foundational, Operational, and Relational.

Foundational Work Products

Foundational work products explore the discipline of forensic science generally and fulfill the Commission's Objective 1, "strengthening the validity and reliability of forensic evidence." Through these work products, the Commission has sought to accomplish its mission in three ways: strengthening the scientific basis and research standards for forensic science, assessing how forensic science is currently used and understood by the community, and understanding the community's potential to produce high-quality forensic evidence. The Commission believes that the implementation of these practices will assist in assuring that forensic evidence is based on valid scientific research and that forensic science is used effectively and accurately.

As of January 2017, the Commission has adopted five (5) Recommendations and five (5) Views documents in the Foundational category (see Appendix C).

Operational Work Products

Operational work products address management and laboratory systems practicing forensic science and fulfill the Commission's Objective 2, "enhancing quality assurance and quality control in forensic science laboratories and units" as well as MDI systems in the United States.[22] The Commission's operational work products can be categorized into those discussing general laboratory and forensic science practices and those focusing on the improvement of MDI systems. Operational work products seek to achieve several goals: implementing professional standards across the practice of forensic science by encouraging broad accreditation of FSSPs and certification of practitioners; implementing quality-control mechanisms

[21] DOJ National Commission on Forensic Science Adopted Work Products. Retrieved from: https://www.justice.gov/ncfs/work-products-adopted-commission

[22] Medicolegal death investigation (MDI) systems refer to the medical examiner and coroner systems existing in the United States as well as the investigation units that support these systems.

to ensure reproducible forensic techniques are used; creating a culture of learning from mistakes with a robust process (root cause analysis); and increasing capacity and improving infrastructure between the forensic practitioner and law enforcement communities (through system interoperability, communication networks between medical examiner and coroner offices, and the National Disaster Call Center).

As of January 2017, the Commission has adopted twelve (12) Recommendations documents and eleven (11) Views documents in the Operational category, which are subdivided into accreditation and certification topics and improving infrastructure and increasing capacity (see Appendix C).

Relational Work Products

Relational work products analyze the way forensic science is understood and communicated to the users of forensic science, including investigators, lawyers, judges, victims, defendants, and the general public. Many of these work products arose from the Commission's Objective 3 for "identifying and recommend[ing] scientific guidance and protocols for evidence seizure, testing, analysis, and reporting by forensic science laboratories and units"[23] as well as one of its express duties, "to develop proposed guidance concerning the intersection of forensic science and the courtroom" from Duty C (see list above). The Commission's relational work products address the language used within the forensic community and expert testimony to discuss forensic findings and recommend practices by which judges and attorneys can interact with forensic evidence and forensic experts in the courtroom.

As of January 2017, the Commission has adopted three (3) Recommendations documents and seven (7) Views documents in the Relational category (see Appendix C).

During the proceedings of Meeting #12, the Reporting and Testimony Subcommittee indicated that they will continue development of the two remaining NCFS draft work products under consideration: a Views document on Report and Case Record Contents (Operational), and a Views document on Statistical Statements in Forensic Testimony (Relational). These two documents are currently in draft form and may be finalized by the subcommittee for discussion and vote by the full Commission at the upcoming Meeting #13 in April 2017.

II. LOOKING TO THE FUTURE

The work of the Commission has been involved with identifying gaps and making recommendations to improve quality assurance within laboratories; generating more research in areas identified by the National Research Council 2009 report, *Strengthening Forensic Science in the United States: A Path Forward;* and determining how to move forward in creating a more robust research culture supporting the practical application of forensic science in the courtroom. The Commission also focused on issues of laboratory management, oversight, and accreditation as well as examiner certification, and documenting and reporting analysis results. Although the Commission has made significant progress in these areas, what remains is even more challenging—that is, the identification of the implications and complexities in which these considerations will impact the criminal justice system.

Topics that were not explored and should be evaluated by the Commission or other groups with a multiple stakeholder perspective willing to take on these important tasks can be grouped into the same three broad categories mentioned in the first section of this report—Foundational, Operational, and Relational—mirroring the four objectives identified in the Commission's Charter.

[23] Forensic science laboratories and units are broadly defined to include both those that provide forensic sciences services and the consumers of such services.

A. Foundational

Much of the work of the Commission was directed in trying to strengthen the foundational underpinnings of forensic disciplines by calling for additional research and a review of the current literature. The Commission believes that the following three foundational areas have not been completed:

1. Undertake a survey of law enforcement agencies conducting forensic science analysis.

Although the Commission was focused on drafting recommendations for the Federal government and DOJ forensic laboratories, the Commission also recognized at the outset that the number and diversity of entities at the state, local, and Federal level relying on each other and the extent to which forensic services are provided to the criminal justice system are not fully understood. For example, state and local agencies frequently call on the expertise and services of Federal laboratories, while conversely, the Federal prosecutors on occasion use services of local examiners in lieu of Federal laboratories. In addition, there is a growing trend by laboratories to outsource work to private laboratories for forensic analyses. However, Commission recommendations adopted by DOJ are not binding on non-DOJ laboratories. Additionally, information sharing across jurisdictions is often necessary. This is particularly the case since databases, such as DNA, fingerprints, shoeprints, digital forensics data files (e.g. hash sets of known or suspected child exploitation files) and the like, are increasingly relied upon by agencies at all levels. Interoperability needs to be considered.

The Commission believes that a better understanding of the full scope and quality of laboratories and forensic science service providers that deliver forensic science data is essential to addressing many critical questions. The DOJ Bureau of Justice Statistics designs, implements, and establishes surveys on forensic services, and it is willing to share these data with the Commission. Data have been gathered by different organizations, but a survey focused on answering the Commission's questions has not been completed. Opportunities for doing so should continue to be a priority.

2. Develop implementation and enforcement recommendations for the uniform code of professional responsibility.

The Commission recommended a national code of ethics and professional responsibility for FSSPs and FMSPs. A revised version of the code that was passed by the Commission was adopted by DOJ to be used in DOJ component Federal laboratories. However, there are still substantial questions about how broadly such a code should or could apply and how (or even if) enforcement mechanisms should be implemented. What can or should the accrediting bodies do to move this forward? Is there an interplay between certification of examiners and a national code? These and many other questions remain unexplored and unanswered.

3. Address digital forensics.

When the Commission began its work, digital evidence was specifically excluded from its scope. The Charter was later amended in 2015 to allow the Commission to consider digital forensics. What became obvious right from the beginning is that the challenges facing digital forensics are in some ways unique. This area of practice is fast paced, often done in law enforcement settings by technicians rather than scientists, and has security issues that may not be of concern in other areas of forensics. Digital forensics, as a fairly new yet pervasive area of forensic science, can benefit from guidance of the Commission or similar group regarding quality assurance, foundational reliability, evidence preservation, and more. This entire area of forensic science needs more study and significant input from subject-matter experts. The Attorney General as well as the Federal government could benefit from further evaluation of these issues.

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B. Operational

1. Provide guidance on evidence preservation and retention.

There has been guidance by other organizations concerning biological evidence preservation.[24] However, this is a complex area, and more work is needed on the scope, policies, and methodologies necessary for biological evidence preservation, as well as other kinds of evidence preservation (e.g., digital evidence). What can and should be done regarding retention of evidence that may have forensic value in the future? What are the legal consequences of granting access to evidence to individuals other than officers of the court, such as crime victims and their families, so that they can do additional forensic testing? Guidance is needed for the forensic testing of cold-case evidence, particularly when advances in testing may make re-evaluation worthwhile, and for the retesting of evidence in a case that has been previously litigated. Are there, or should there be, ways that victims can pay for private testing of untested evidence when their interest in answers continues beyond the criminal justice system's needs in pursuing the case? What is the status of state legislation/requirements/practices regarding evidence testing and destruction? Are there practices in place in state jurisdictions that should or could be adopted federally? Are there, or should there be, guidelines for evidence handling by defense experts, court personnel, and even jurors to ensure ongoing preservation and integrity of biological material on items of evidence in a trial?

2. Consider examiner certification: is this feasible, and should this be a requirement for Federal examiners?

The Commission has weighed in on certification and expressed its view that FSSPs should be encouraged to certify practitioners. There was exploration as to the cost, accessibility, and training issues surrounding certification. The Commission did not fully address this issue, and further exploration is needed.

3. Address source code accessibility and commercial transparency.

As forensic analysis evolves, the role of computers in forensic analysis has also grown. These technologies have led to questions about discovery of closed-source software programs used to generate the analysis or used as part of commercially available instruments during forensic analysis. Should source code be available to prosecution and defense for analysis? Should the Federal government have policies about using open-source or closed-source instrumentation in their laboratories? If access is allowed, what guidance should be given in relation to access? Are protective orders appropriate?

4. Consider recommendations regarding how to address human factors issues in MDIs, especially around cases involving child death, in-custody death, and police shootings.

Human factors such as implicit, cognitive, and implied bias can and are being addressed in forensic science disciplines. In particular, MDI presents unique issues and challenges related to human factors. When cases are high profile or involve issues of great public interest, these factors may be magnified. Examining and exploring these human factors and how they affect these kinds of cases could lead to great insight in all MDIs.

[24] NIST/NIJ Technical Working Group on Biological Evidence Preservation. Retrieved from: https://www.nist.gov/topics/forensic-science/nistnij-technical-working-group-biological-evidence-preservation; http://nvlpubs.nist.gov/nistpubs/ir/2013/NIST.IR.7928.pdf

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C. Relational

1. Train forensic science users—law enforcement, lawyers, judges, and the public.

The Training on Science and the Law subcommittee was one of the first subcommittees created by the Commission. It was charged with the task of looking at training lawyers and judges on forensic science. What became clear over time was that this training was important, but this work could wait until after issues surrounding foundational reliability and laboratory operational reforms were addressed. As a result, the Commission made only a general recommendation that a forensic science curriculum should be developed.

Many questions remain. What does this curriculum look like, who is to implement such a curriculum, and what funding and resources are needed for curriculum development and distribution to accomplish this goal? Lawyers need guidance on who should determine when something is foundationally sound: When is forensic analysis sound enough to be used as a forensic tool or an "investigative lead," and when is it robust enough to be admissible? Are these concepts, or should these concepts, be distinguishable? Judges and lawyers alike need to understand the differences between presumptive and confirmatory testing, and they require better guidance on how to assess and evaluate admissibility. The subcommittee did mention that there is a need for education among the general public, but no further action was taken.

2. Make recommendations for how autopsy findings regarding cause and manner of death might be presented to the fact finders (whether in investigation or adjudication phases of a case).

The Commission's MDI subcommittee made several recommendations to improve the country's coroner/medical examiner system. Recommendations regarding the more relational aspects of those involved in MDI, the fact finder, and the public need additional exploration. Considering how "cause" and "manner" of death findings are presented and understood could lead to improved communication between these organizations.

3. Establish key principles of a defendant/victim notification process.

The Commission adopted a Recommendation on Root Cause Analysis that makes a policy recommendation for the adoption of root cause analysis protocols for all FSSPs and forensic science medical providers (FSMPs). In addition, the Commission's recommendation for a model code of professional responsibility, which in part recommended FSSPs to "appropriately inform affected recipients (either directly or through proper management channels) of all nonconformities or breaches of law or professional standards that adversely affect a previously issued report or testimony and make reasonable efforts to inform all relevant stakeholders, including affected professional and legal parties, victim(s) and defendant(s)", was only partially adopted by DOJ. Unresolved issues include how to identify those adversely affected; what processes can or should be used to do so; who should be involved in this process; who is responsible for notification; can there be systems developed to ensure that today's victims and defendants can be reached—if necessary—decades later; and should there be a model process developed for notice of affected professionals and legal parties, victims, and defendants? There are individual cases around the country that serve as examples of how this might be done. Additionally, most effective examples of large-scale notifications have been collaborative processes between FSSPs, attorneys, court clerks, and others. Discussion, debate, and serious consideration as to how to most effectively implement such a process needs more work.

4. Establish research-based means of effectively and accurately communicating forensic science information with the judicial system and the public.

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As previously mentioned, some of the Commission's work focused on the nexus between the laboratory and the courtroom and considered how information can be effectively and accurately communicated to those within the legal system as well as to the jury. Recommendations included discontinuing the use of some terminology. The Commission reached general consensus that language in reports and testimony should not be misleading to the fact finder. Exploring and establishing research-based means of how to effectively and accurately communicating forensic science information in a way that is meaningful to the finder of fact would assist in guiding how practitioners as well as attorneys can best communicate without misleading the finders of fact. There is also concern that even when information is accurately reported and testified to, the lack of forensic-related knowledge of those in the judicial system (judges, lawyers, and juries) can lead to confusion.

There is existing social science research on juries and their ability to process complex forensic information. Incorporating this research and determining whether further social science research on how particular terminology and/or statistical statements are presented and understood by the fact finder, could lead to more precision, therefore leading to a better understanding by the investigators, lawyers, judges, and the general public. Questions include how to most effectively communicate forensic science concepts to the trier of fact, and whether comparative statements or statistical statements are more or less helpful to the fact finder. Questions remain about how such statements and language, including those used by attorneys in describing and presenting the forensic findings again, are understood by the fact finder.

5. Focus on issues with communication and understanding between forensic analysts, investigators, lawyers, judges, juries, and the public.

The Commission should consider recommending training judges and attorneys on the forensic-related information that is used in the courtroom. Many issues arise when the legal community does not understand the terms, techniques, and conclusions that forensic experts present in court. For example, judges and attorneys should be trained on how to address laboratory results that may need further clarification, such as the meaning of a finding of "inconclusive." The same is true regarding the use of presumptive testing as opposed to confirmatory testing in court cases. Do lawyers, judges, and law enforcement personnel know the difference between these types of testing? Would they know the best form of testing to develop an investigatory lead? Should they receive guidance for legislation or rules of evidence to address presumptive testing? How would this knowledge come into play when assessing the results of a preliminary breath testing conducted roadside, which is often not admissible to prove a DUI, compared with the use of infrared spectrometry breath-test technologies performed for evidentiary purposes? Is there other forensic testing that should be treated similarly? The Commission or other similar group should continue to examine this communication and knowledge gap and its effect on courtroom proceedings.

CONCLUSION

The National Commission on Forensic Science has provided an essential forum for the exchange of information and discussion on public policy to improve the forensic sciences. This organization's diversity in subject-matter experts, interests, perspectives, and geographic and jurisdictional representation has generated rich discussion about issues facing the forensic science community and the criminal justice community, as well as the public. The solicitation of public comments for draft work products from subcommittees allowed participation by any interested person or organization and provided the Commission with access to a range of opinions. But there is still work to be done.

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Many of these issues have been worked on by discrete entities such as working groups or agencies. The Commission's focus has been to take these efforts, inform them with a national and interdisciplinary perspective, and place them into a broader view of the needs of forensic science.

Criminal justice is a high-stakes endeavor. As in health care or aviation, errors at any stage of the process can have devastating consequences to victims, suspects, and the public. Decisions made as a result of forensic evidence have a direct and permanent impact on the lives of citizens. Because of this, the U.S. criminal justice system strives for excellence. But getting to the right result requires not only excellence in all phases of the process, but also the public's trust.

Creating excellence is an ongoing effort. Scientific understanding and technology are constantly changing. Like health care and aviation, the field of forensic science will have to adapt, and its practitioners will need to be forever vigilant. But there are special challenges for forensics, as it serves an adversary system. There is often little room for adversaries to reflect on policy issues that impact all stakeholders, let alone to reflect on system wide adjustments to accommodate changes in scientific understanding and technology. This challenge is answered in part by the existence of a forum such as the Commission—a forum that generates an open dialog among stakeholders, scientists, the public, and DOJ.

A forum such as the National Commission on Forensic Science in such a complex system has been a proven asset over the past several years. The Commission has been successful in identifying policies that will advance forensic science. It is critical to continue a path forward to provide further exploration into the questions outlined in this report, as well as those that have not yet been considered.

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