

TESTIMONY

Mr. Matthew Gamette
American Academy of Forensic Sciences

Before the House Committee on Science,
Space, and Technology
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(Updated 9/13/19)

“Raising the Bar: Progress and Future
Needs in Forensic Science”

Chairwoman Johnson, Ranking Member Lucas and Members of the committee, thank you for the opportunity to come before you today to testify on behalf of the American Academy of Forensic Sciences (AAFS). Since 1948, the AAFS has served a distinguished and diverse membership. Its over 6,600 members are divided into eleven sections spanning the forensic enterprise. Included among the Academy's members are physicians, attorneys, dentists, toxicologists, anthropologists, document examiners, digital evidence experts, psychiatrists, physicists, engineers, criminalists, educators, and others. As a professional society dedicated to the application of science to the law, the AAFS is committed to the promotion of education and the elevation of accuracy, precision, and specificity in the forensic sciences.¹

I am also here representing the Consortium of Forensic Science Organizations (CFSO). CFSO was formed in 2000 and is an association of six forensic science professional organizations: American Academy of Forensic Sciences; American Society of Crime Laboratory Directors; International Association for Identification; American Academy of Psychiatry and the Law; National Association of Medical Examiners; and Society of Forensic Toxicologists - American Board of Forensic Toxicology. These professional organizations together represent more than 21,000 forensic science professionals across the United States. One of its primary missions is to speak with a single forensic science voice in matters of mutual interest to its member organizations.²

I have worked at a crime lab in some capacity for over 17 years and am currently the Laboratory System Director of the Idaho State crime laboratory system. Since I started my first job as a biology/DNA analyst over 17 years ago the forensic science as a profession has evolved, and the science has advanced through research, implementation of quality management systems, development of standards, and the training of practitioners.

On behalf of the practitioner community, I thank you for hosting this hearing. I look forward to providing you with an overview of the state of forensic science since the National Academy of Sciences study, standards development, our successes since the study was completed, the role of the Federal government and finally our challenges and anticipated needs for the future.

The 2009 National Academy of Sciences report entitled *Strengthening Forensic Science in the United States: A Path Forward*³ (NAS report) was a significant event in our community. In fact, it is a study the forensic community itself requested. Through its recommendations, the study supported the forensic science community's on-going efforts to improve the practice and forensic science as a whole. With support from the Federal government, we have made important strides in implementing many of the significant

¹ <https://www.aafs.org/about-aafs/#aafs-history>.

² <http://thecfso.org/>.

³ <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf>.

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recommendations from the report. Subsequent efforts, such as the National Commission on Forensic Science (NCFS), the NIST Organization of Scientific Area Committees (OSAC), the study by the President’s Council of Advisors on Science and Technology (PCAST report), and discipline specific studies have greatly informed the forensic science community of areas where needs exist and should be addressed. Other offices have been put in place to assist in advancing the science such as the Forensic Laboratory Needs-Technology Working Group (FLN-TWG), Forensic Science Technology Working Group, and the Council of Federal Forensic Laboratory Directors (CFFLD). Recognizing that our profession is based on the continued development of science and technology, and while improving practices and procedures, we believe it is critical for the Federal government to continue to provide its leadership and resources to the forensic community including its stakeholders.

If you will permit me, I would like to provide you with detail on our progress over the past ten years considering the 2009 National Academy of Sciences report entitled *Strengthening Forensic Science in the United States: A Path Forward*.

THE FEDERAL RESPONSE

The Federal government took immediate action to bring the forensic science community together to consider the findings and recommendations of the NAS report. The White House’s Office of Science and Technology Policy (OSTP) created a “Subcommittee on Forensic Science” (SoFS) in July 2009 to assess the issues raised by the NAS report. The SoFS oversaw five interagency working groups (Accreditation and Certification; Standards, Practices, and Protocols; Education, Ethics, and Terminology; Research, Development, Testing, and Evaluation; and Outreach and Communication), which were responsible for most of the work. SoFS participation spanned 23 federal departments and agencies and was comprised of nearly 200 federal subject matter experts and 49 individuals representing state, county, and local forensic scientists, in conjunction with the legal community, a unique process to the NSTC^[4] that underscored the recognition that nearly 95 percent of forensic science examinations are performed at the state and local level. This engagement provided a more formal and consistent mechanism for consideration of unique perspectives and input from the broader practitioner, criminal justice, and academic communities.

The purpose of the subcommittee was to “advise and assist the National Science and Technology Council, Committee on Science, and other coordination bodies of the Executive Office of the President on policies, procedures, and plans related to forensic science at the Federal, state, and local levels. The SoFS coordinated a robust effort across Federal, state, and local agencies to identify and address important policy, program, and budget matters, as well as potential activities to

⁴ National Science and Technology Council.

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enhance and/or amalgamate forensic science initiatives that support research and development; training, education, and ethics; accreditation and certification; and standards of practice. Activities of the SoFS were coordinated through five interagency working groups (IWGs). The IWGs were each chartered with distinct objectives, and their deliberative processes included research and analysis into particular issues of impact that could be incorporated into policy proposals. The subcommittee's findings and work products will inform efforts to enhance future forensic science policy, research, and practice.”⁵

This body completed its work in December 2012 and published its report, *Strengthening the Forensic Sciences*, in May 2014.⁶ The report recommended, among other things, the accreditation of forensic science service providers, the certification of forensic examiners and medicolegal personnel, proficiency testing for forensic examiners, and a national code of ethics for forensic service providers. Importantly, the Research, Development, Testing, and Evaluation interagency working group pursued the identification of foundational research that can be mapped to specific principles across the various disciplines of forensic science. The group was also responsible for identifying Federal investments in forensic science research. The SoFS was the beginning of efforts by federal, state, county and local practitioners and laboratories to implement the NAS report's recommendations.

Efforts by the co-chairs of the SoFS (one from NIST and one from DOJ) to promote a partnership between NIST and DOJ in the forensic science space lead to the creation of the National Commission on Forensic Science (NCFS) in DOJ and the OSAC in NIST in 2013. This partnership between DOJ and NIST assimilated into a joint effort both a policy and science endeavor to strengthen and enhance forensic science.

NCFS, OSAC, AND STANDARDS DEVELOPMENT

“The NCFS was co-chaired by the Deputy Attorney General and the Director of NIST and consisted of 29 voting commissioners and eight *ex officio* non-voting commissioners. The Commission included federal, state, and local forensic science service providers; research scientists and academics; law enforcement officials; prosecutors, defense attorneys and judges; and other stakeholders from across the country. The work of the commission was supported by several subcommittees: Interim Solutions, Accreditation and Proficiency Testing; Human Factors; Medicolegal Death Investigation; Reporting and Testimony; and Scientific Inquiry and Research.”⁷

⁵ See Weedn, V. *Recent Developments in the Forensic Sciences*, The United States Attorneys' Bulletin, Vol. 65, No. 1, January 2017; NAT'L SCI. & TECH. COUNCIL'S SUBCOMM. ON FORENSIC SCI., STRENGTHENING THE FORENSIC SCIENCES (2014), pages iii,1.

⁶ NAT'L SCI. & TECH. COUNCIL'S SUBCOMM. ON FORENSIC SCI., STRENGTHENING THE FORENSIC SCIENCES (2014)

⁷ Weedn, V. *Recent Developments in the Forensic Sciences*, The United States Attorneys' Bulletin, Vol. 65, No. 1, January 2017, page 5.

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The NCFS issued many recommendations and views documents on various subjects related to the enhancement of the intersection between forensic science and the law. Some of these views will be discussed later. In 2017, after NCFS failed to approve a statement in its final report that the commission should continue, the commission expired pursuant to the rules of the Federal Advisory Committee Act, and the Attorney General did not seek to extend it for a third term.

The OSAC is an ongoing effort, providing valuable work products for the forensic science community. “The Organization of Scientific Area Committees (OSAC) for Forensic Science works to strengthen the nation’s use of forensic science by facilitating the development of technically sound forensic science standards and promoting their adoption. These standards are written documents that define minimum requirements, best practices, standard protocols, and other guidance to help ensure that the results of forensic analysis are reliable and reproducible. The OSAC is administered by the National Institute of Standards and Technology (NIST), but the great majority of its more than 550 members are experts from federal, state, county, and local government agencies, academic institutions, and the private sector. These members have expertise in twenty-five specific forensic disciplines, as well as general expertise in scientific research, measurement science, statistics, law, and policy. OSAC members work together to develop and evaluate forensic science standards via a transparent, consensus-based process that allows for participation and comment by all stakeholders.”⁸

Each OSAC discipline specific subcommittee works by discussing existing standards and best practices in their respective discipline. They discuss matters such as training of practitioners, methods and practice, quality assurance measures, reporting, statistics, and court testimony. When gaps are identified, the subcommittee starts a drafting process to revise an existing standard or create a new one. Consideration is given to issues that must be coordinated among a group of subcommittees (e.g. training or proficiency testing). The OSAC subcommittees are the home of new ideas; they recommend areas of discipline specific research; they vet existing standards, and they draft new proposed standards and guidelines. OSAC subcommittees have access to legal, quality assurance, statistics, and human factors experts that can provide guidance and expertise as they navigate the process.

Once a proposed standard has been developed and vetted through the OSAC subcommittee process, it is then outsourced to a Standards Development Organization (SDO). The most prevalent SDOs used in the forensic workspace are the AAFS Standards Board (ASB), the American Society for Testing and Materials (ASTM), the

⁸ <https://www.nist.gov/topics/organization-scientific-area-committees-forensic-science>. Last accessed 9/6/19. The members also have expertise in standards development, human factors and quality assurance.

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American Dental Association (ADA), and the National Fire Protection Association (NFPA). The selection of the SDO is up to the group putting forward the standard proposal. The only stipulation is that the standard cannot compete with an existing standard from any organization.

The AAFS Academy Standards Board (ASB) was launched February 2016 for the purpose of developing forensic-related standards that support forensic professionals and the legal community that rely on forensic science. It is the only SDO that focuses solely on forensic science standards. The ASB oversees 12 Consensus Bodies which review OSAC work products:⁹

- Anthropology
- Bloodstain Pattern Analysis
- Disaster Victim Identification
- DNA
- Dogs and Sensors
- Firearms and Toolmarks
- Footwear and Tire
- Forensic Document Examination
- Friction Ridge
- Medicolegal Death Investigation
- Toxicology
- Wildlife Forensics

As of June 3, 2019, the ASB has received 129 documents drafted by OSAC for development into American National Standards Institute (ANSI). The ASB is currently handling 60% of the OSAC documents.¹⁰

ASB documents as of June 3, 2019¹¹

Consensus Body (OSAC Subcommittee)	Total Received	Published ANS	In process	Submitted for development	Suspended Withdrawn
Anthropology	3	1	2		
Bloodstain Pattern	5	2	3		
DNA/Biology	27	1	18	5	3
Dogs and Sensors	18	1	17		
Disaster Victim	10	4	4	2	
Firearms/Toolmarks	21		15		6
Footwear/Tire	9		8	1	
Forensic Documents	6		6		

⁹ Communication from Director of the ASB to Ken Melson, 6/20/19.

¹⁰ Communication from Director of the ASB to Ken Melson, 6/20/19. Other DSOs to which OSAC submits drafts are ASTM (10), ADA (1), and NFPA (1).

¹¹ Communication from Director of the ASB to Ken Melson, 6/20/19.

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Friction Ridge	5		5		
Death Investigation	1		1		
Toxicology	16	2	13		1
Wildlife	8	6	2		
TOTALS	129	17	94	8	10

The ASB is currently funded by a grant from the Arnold Foundation, which expires in March 2021. It is imperative that the ASB receive additional grants. *The Forensic Science and Standards Act* should provide grant funding to the ASB for purposes of carrying on its work as an ASB adjunct to the OSAC.

An SDO is a consensus-based process where experts and stakeholders can further refine the standard. The SDO must publish the proposed standard for public comment. Each public comment must be adjudicated, a response provided, and an appeal process afforded. Once a standard has been approved through the SDO, the standard goes back to the OSAC for further vetting. At this point in the process, the OSAC proffers the SDO produced standard for entry on the “OSAC Registry.”

All OSAC members and the public at large are able to comment on the appropriateness of the standard going on the OSAC Registry. The comments at this point in the process are not for the purpose of changing the standard, but rather for determining if the standard is fit to be placed on the registry and be endorsed by OSAC.

Currently there are nineteen (19) standards on the OSAC Registry. These standards must be reviewed regularly as part of the SDO process. Once an SDO has proffered a standard, the SDO remains responsible for the regular review of that standard. This process has many opportunities for experts, stakeholder groups, and the general public to weigh in on the proposed standard. The hard discussions are happening, and the standards are being thoroughly vetted. It is important to realize that forensic science is following the same process that is used to create standards in all industries. In fact, the OSAC Standard Registry process adds another level of scrutiny beyond the SDO process used by most industries.

It is important to note that currently NIST pays for practitioners and officers of the courts to access the ASTM standards and the ASB provides their standards for free through a generous private foundation. However, free or reasonably priced access for state, county, local and tribal practitioners and officers of the court to these standards must continue to be a high consideration for the federal government.

Another critical mission of the OSAC is to assist NIST, and in collaboration with NIJ, identify and prioritize research needs in the forensic science community. OSAC identified research needs are considered by at least two NIJ working groups as part of the federal granting strategy.

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STANDARD TERMINOLOGY, TESTIMONY AND REPORTS

We agree with the NAS report that there should be standard terminology to be used in reporting and testimony, and model laboratory reports. Many efforts are in place to implement these recommendations. Specifically, the terms used to describe findings, conclusions, and degrees of association between evidentiary material and particular people or objects should be reconsidered. In fact, that has been done to a great degree. The NCFCS made recommendations for creating consistent and uniform language within disciplines, , including definitions of forensic science and forensic science service providers.¹²

Elsewhere, NIST has completed two expert working group reports. The first was in 2012 by the Expert Working Group on Human Factors in Latent Print Analysis entitled *Latent Print Examination and Human Factors: Improving the Practice through a Systems Approach*. Another is pending publication, written by the Expert Working Group for Human Factors in Handwriting Examination entitled *Forensic Handwriting Examination and Human Factors: Improving the Practice Through a Systems Approach*. Both publications discuss the recommended elements reports on the comparison of the known exemplars and unknown evidence samples should have. Those discussions can be used by other forensic disciplines to guide reports in those areas. The report on handwriting examination also contains terminology definitions.

The NIST OSAC has surveyed the terminology landscape and has developed a forensic science definition lexicon. The lexicon was placed online, and I now lead the effort for the OSAC QIC to develop OSAC approved definitions for the most controversial forensic science terms. The OSAC preferred terms task group, comprised of various stakeholder groups, has already agreed on twelve terms with twenty more working through the process.¹³ This has been a highly collaborative effort between diverse stakeholders, and OSAC is making significant progress on defining terminology.

Another significant development is the participation of many forensic science organizations in the International Forensic Science ISO Technical Advisory Committee. This group establishes standards at the international level. Most of the major forensic science organizations participate in this relatively new development. This allows the United States to participate heavily in international forensic science standards making, including international forensic science terminology standards.

The Department of Justice is in the process of developing guidance documents governing the testimony and reports of its forensic experts, known as “Uniform Language for Testimony and Reports,” or ULTR documents. They are designed to provide guidance on the submission of scientific statements by DOJ forensic examiners when drafting reports

¹² <https://www.justice.gov/archives/ncfs/page/file/1004446/download>.

¹³ OSAC subcommittees are also addressing terminology at a discipline specific level. **Matthew Gamette, Sept. 10, 2019, “Raising the Bar: Progress and Future Needs in Forensic Science.” (Updated 9/13/19)**

or testifying. These ULTRs are best practice exemplars for state, local and Tribal laboratories, as well as federal laboratories. As of March 19, 2019, the following ULTRs have been completed.¹⁴

ULTR for General Forensic Chemistry and Seized Drug Examinations
ULTR for the Forensic Anthropology Discipline
ULTR for the Forensic DNA Discipline – Autosomal DNA with Probabilistic Genotyping
ULTR for the Forensic DNA Discipline – Mitochondrial DNA
ULTR for the Forensic DNA Discipline – Y-STR DNA
ULTR for the Forensic Fiber Discipline
ULTR for the Forensic Firearms/Toolmarks Discipline – Fracture Match
ULTR for the Forensic Firearms/Toolmarks Discipline – Pattern Match
ULTR for the Forensic Geology Discipline
ULTR for the Forensic Glass Discipline
ULTR for the Forensic Hair Discipline
ULTR for the Forensic Latent Print Discipline
ULTR for the Forensic Metallurgy Discipline
UTLR for Forensic Serology Discipline

RESEARCH

The NAS report found that as of 2009, “[l]ittle rigorous systematic research has been done to validate the basic premises and techniques in a number of forensic science disciplines. The committee sees no evident reason why conducting such research is not feasible; in fact, some researchers have proposed research agendas to strengthen the foundations of specific forensic disciplines. [footnote omitted] Much more federal funding is needed to support research in forensic science and forensic pathology in universities and in private laboratories committed to such work.”¹⁵

We agree that more federal funding for research and the development of stronger ties between academic research community and the forensic science community is vitally necessary. As the PCAST recognized in its addendum to the main report, “[a] generation of forensic scientists appears ready and eager to embrace a new, empirical approach—including black-box studies, white-box studies, and technology development efforts to transform subjective methods into objective methods.”¹⁶ The PCAST report was welcomed as a voice on the issue of scientific validity and reliability, yet funding for research has been sparse at best.

¹⁴ <https://www.justice.gov/olp/uniform-language-testimony-and-reports>.

¹⁵ NAS report, p 189.

¹⁶ https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensics_addendum_finalv2.pdf.

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In response to the PCAST report, the AAFS noted that it “recognizes the need for improvement, where needed, and view (sic) the findings in the President’s Council of Advisors on Science and Technology (PCAST) report as notice of needed validation and improvement. While the Academy does not endorse every statement within the PCAST report, we appreciate the efforts of PCAST to clarify the scientific meaning of validity with respect to feature comparison analysis. The PCAST report is an important start to the discussion of scientific validity and we look forward to continuing that discussion with the larger community of forensic science practitioners.” The AAFS went on to highlight that while “PCAST has conducted its work on assessments of scientific validity, the Academy, the National Commission on Forensic Science, the National Institute of Standards and Technology, the National Institute of Justice, and others within the forensic science community have been working to improve standards, training, quality control, oversight, and other necessary components of forensic science services.”¹⁷

NIST and the FBI provide valuable foundational research. The PCAST report, at page 132, recognizes that the FBI Laboratory carries out important research and development activities so much so that the report, in its recommendation #5, endorsed a research budget increase for the FBI to a total of \$30 million for its R&D activities, particularly for the intramural research program generally.

NIST is one of the government’s research agencies. The PCAST report recommended that NIST be tasked to assess the foundational validity of current and newly developed forensic feature-comparison technologies. NIST has taken on that task by evaluating foundations of DNA mixture interpretation and bitemark evidence. Criteria for these reports have been issued and we anticipate reports being released soon. This tasking could be expanded to include other forensic disciplines, technologies, and methodologies. NIST also reviewed a significant amount of literature that forms the “body of research” supporting forensic science disciplines. That work is critically important to assess what further research needs to be done.

NIST’s OSAC makes recommendations for research, as do the NIJ working groups, and the CFFLD. NIST has also funded the Center for Statistics and Applications in Forensic Science (CSAFE)¹⁸ that has a practitioner advisory board, a senior advisory board, and a technical advisory board, all of which are composed of a diverse group of stakeholders, including many who are critical of the forensic sciences. CSAFE conducts research into human factors that create biases in the forensic sciences as well as statistical foundations for various forensic disciplines, including several feature comparison disciplines.

In March 2018, the Office of Justice Programs and Department of Health and Human Services established a Medicolegal Death Investigation (MDI) Federal Interagency

¹⁷ <https://news.aafs.org/policy-statements/presidents-council-of-advisors-on-science-and-technology-pcast-report/>.

¹⁸ <https://forensicstats.org/>.

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Working Group (MDI-WG). One of the working group's stated missions is to coordinate MDI research priorities. NIJ is a principal player in establishing the research priorities.¹⁹

To date, much research has been conducted and published in peer-reviewed publications. Since the NAS report, NIJ has provided over \$129 million in forensic science research funds.”²⁰ The PCAST report prepared an extensive compendium of scientific studies and research in the feature comparison disciplines discussed in the report. Responses to the PCAST report were varied, but significant criticism was focused on PCAST's assertion that the Council created its own criteria for scientific validity “without providing scientific support that these criteria are well accepted within the scientific community.”²¹ The PCAST ignored many studies supporting foundational validity, but in PCAST's opinion, the studies were not “appropriately designed” for their purposes. We believe this was a mistake, and the published research does add to the premise that feature comparison disciplines in general have demonstrated foundational validity. Nevertheless, as with other national reports, the forensic community is striving to conduct black box and white box studies. But these studies require enormous effort and resources, which is where the federal government can assist. We support the PCAST recommendation for increased funding for research, and the increase in funding in the proposed *Forensic Science and Standards Act*.

One criticism of the forensic science community was the lack of access to peer reviewed scientific journals. I report much progress in this area. The AAFS publishes the highly respected Journal of Forensic Science, and many other organizations have raised the bar in this area. ASCLD recently signed agreements with three international peer-reviewed and open-access scientific journals to publish validation studies, research, and other forensic science articles that will be free to everyone to access and utilize. The forensic science community is increasingly self-embracing open-access, peer-reviewed, and indexed scientific journals. Many organizations, such as AAFS and ASCLD, are publishing the proceedings of their scientific meetings.

AUTONOMY OF FORENSIC LABORATORIES

The issue of removing crime laboratories from law enforcement agencies has always been a controversial topic. Many argue that separating crime laboratories from a parent law enforcement agency would reduce possible bias and influence. But the practicalities of accomplishing that is formidable and the matter is a states' rights issue that would face significant resistance from numerous governors. The NAS report recommended laboratories be autonomous from or independent of law enforcement agencies. NAS recommended incentive funds to encourage the disorgement of crime laboratories from their parent agencies. Many crime laboratories, however, belong in law enforcement

¹⁹ <https://ojp.gov/resources/ojp-hhs-mdi-wg.htm#background>.

²⁰ <https://www.forensiccoe.org>.

²¹ <https://www.fbi.gov/file-repository/fbi-pcast-response.pdf/view>.

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agencies that are overseen by an elected official, making the decision to downsize their departments more than just a financial one. In addition, the cost of removing the laboratory from the parent agency would cost much more than the federal government's incentive payments. Each laboratory would need administrative officers, personnel specialists, budget officers, IT personnel and others to support the functions and employees of the laboratory.

In many states, state law mandates where laboratories are placed within state government and how they are structured. Perhaps an achievable goal would be to ensure that labs have processes to ensure autonomy within their parent agencies, including oversight by a scientific director with decision-making authority. Since approximately 90% of the nations' multi-disciplinary laboratories are accredited, there is already a requirement for them to avoid undue influence.

Currently, there are a number of different reporting models for crime laboratories. Models exist where laboratories report directly to the governor, the state health department, the attorney general, or a city or county counsel. There are important things to be considered no matter what structure exists. Most significant is the senior scientific director having high-level decision-making ability and being insulated from replacement for political reasons. The Washington DC Department of Forensic Sciences (DFS) and Houston Forensic Science Center (HFSC) are held up as "independent" laboratories. While these laboratories do have a higher level of autonomy, they warn about communications being more challenging with customers and budget woes in bad budget years. They note the positive aspect as being that they can lobby directly for their own needs, but the negative aspect is that there is no entity to lessen the blow of mandatory budget cuts in bad budget years.

Arkansas had a lab system that reported directly to the governor's office. They recently moved the lab back under the public safety department because they determined that department was a better reporting structure. Idaho recently created my position as senior scientific director of the laboratory system with autonomy to make major decisions for the laboratory system. The creation of my position was pushed by the Colonel of the State Police because he recognized the need to clearly communicate the lack of undue influence on the lab in our state.²² It should be recognized that some state labs do very little work for their parent agency. Most of the work comes from other state, county, and local law enforcement. Therefore, the potential undue influence is different for each laboratory based on the customers they serve and their funding structure.

As mentioned earlier, the NAS report does not go so far as to require the physical separation from the parent law enforcement agency. Recommendation #4 calls for

²² ATF also created a new Senior Executive Service position of Deputy Assistant Director, Forensic Services, for the head of the ATF forensic laboratory.
<https://www.officer.com/home/article/10227645/atf-names-forensic-scientist-czarnopys-to-lead-forensic-labs>.

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“removing all public forensic laboratories and facilities from the administrative control of law enforcement agencies or prosecutors’ offices.” The goal of the recommendation is to “maximize independence from or autonomy within the law enforcement community.” We agree that doing all we can to encourage organizational autonomy to eliminate undue influence would help improve the scientific bases of forensic science examinations by reducing cognitive bias resulting from the laboratory’s close association with law enforcement.

Accreditation of laboratories promotes the autonomy of public laboratories from law enforcement agencies and prosecutors’ offices. Laboratories are increasingly recognizing the need for firewalls from undue influence by all stakeholders. Laboratories accredited under the general requirements for the competence of testing and calibration laboratories, ISO/IEC 17025:2017, are required to be impartial, giving laboratory personnel the ability to work with scientific independence. For example, Section 4.1.1 states that “Laboratory activities shall be undertaken impartially and structured and managed so as to safeguard impartiality.” As noted earlier, according to the BJS report on Publicly Funded Forensic Crime Laboratories: Quality Assurance Practices, 2014, 88% of the nation’s 409 crime laboratories were accredited by a professional organization.²³ Since 2014, 89 additional laboratories achieved their initial accreditation.²⁴

The ASCLD National Outreach and Priority Agenda states “Forensic Science Service Providers (FSSP’s) must be completely autonomous and independent from outside influence on all work products, including analytical methods, reporting, results, conclusions, opinions, etc. Most FSSP’s work within parent organizations and governmental structures, and discussions about case priorities, funding, resources, and staffing are common. However, FSSP’s should operate with budgeting and operational independence as much as possible while working to accomplish the requests of stakeholders. In all situations, FSSP’s should be protected from extraneous pressures that compromise the ideals of independence and objectivity; this includes freedom from undue influence from stakeholders, interest groups, parent agencies, and the judicial system.”²⁵

ACCREDITATION

Accreditation of crime laboratories began well before the NAS report and has long been recognized as an integral element of quality management within a laboratory. The Department of Justice has recognized the importance of accreditation. Deputy Attorney General Yates has described accreditation as an assessment of a “forensic lab’s capacity to generate and interpret results in a particular forensic discipline and helps to ensure an

²³ <https://www.bjs.gov/index.cfm?ty=pbdetail&iid=5828>.

²⁴ Personal communication between ANAB and Ken Melson on 9/9/2019.

²⁵ <https://www.asclد.org/wp-content/uploads/2018/10/2018-2019-ASCLD-NOPA.pdf>.

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ongoing compliance to industry and applicable international standards. An independent accrediting body assesses and monitors the quality of the lab's management system by examining factors that include staff competence; method validation; appropriateness of test methods; calibration and maintenance of test equipment; testing environment and quality assurance data. Accreditation is one way to increase the quality of work and reducing the likelihood of errors.”²⁶ All DOJ forensic laboratories and other forensic science labs doing work on federal cases are required to be accredited by 2020. Many state, county, and local labs do a significant amount of work requested by federal law enforcement, federal prosecutors, and federal defenders.

Following legislative directive in the Justice for All Reauthorization Act of 2016 the DOJ also revised its grant funding process to help support new accreditations of laboratories. It clarified that both the Coverdell and the Byrne grants may be used to seek accreditation. In addition, DOJ directed that relevant Office of Justice program grants give preferences to laboratories that will use the money to obtain accreditation.²⁷

Statistics from the BJS studies indicate a steady rise in the number of new accreditations under ISO/IEC 17025 for publicly funded crime laboratory respondents since 2002 from 71% to 83% in 2009, to 88% in 2014.²⁸ Since the 2014 BJS report, ASCLD/LAB and its successor ANAB have accredited 89 more publicly funded laboratories under ISO/IEC 17025.²⁹ It has also accredited 6 calibration laboratories under ISO/IEC 17025 and 33 inspection Bodies under ISO/IEC 17020.³⁰

The National Association of Medical Examiners (NAME) accredits Medical Examiner offices and systems. “NAME accreditation is an endorsement indicating that the office or system provides an adequate environment for a medical examiner in which to practice his or her profession and provides reasonable assurances that the office or system well serves its jurisdiction.”³¹ At the end of 2016 82 medical examiner/coroner officers in 41 states were accredited by NAME.³² the International Association of Coroners and Medical

²⁶ <https://www.justice.gov/opa/pr/justice-department-announces-new-accreditation-policies-advance-forensic-science>.

²⁷ <https://www.justice.gov/opa/pr/justice-department-announces-new-accreditation-policies-advance-forensic-science>.

²⁸ Presentation by Matthew Durose, BJS statistician, to the NCFS on 2/3/14.

²⁹ By 2015 all ASCLD/LAB legacy accreditations expired, and all subsequent accreditations were accomplished according to the ISO/IEC 17025 standards.

³⁰ Personal communication between ANAB and Ken Melson on 9/9/2019.

³¹ <https://name.memberclicks.net/>.

³² National Science and Technology Council, Committee on Science, Medicolegal Death Investigation Working Group (MDI WG) *Strengthening the Medicolegal-Death-Investigation System: Accreditation and Certification-A Path Forward*, December 2016, p. 3. https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/mdi_wg_-_accreditation_and_certification_white_paper_1.6.pdf.

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Examiner (IACME) also accredits medical examiner and coroner offices. As of 2016, 21 officers were accredited in 12 states.³³

The FBI also has an accreditation program for laboratories performing forensic DNA testing or utilizing the Combined DNA Index System (CODIS) to ensure the quality and integrity of the data generated by the laboratory. The accreditation of a laboratory pursuant to the FBI Quality Assurance Standards for DNA Testing Laboratories is often administered by a laboratory accreditation body such as ANAB or A2LA. A2LA also accredits testing laboratories pursuant to ISO/IEC 17025:2017 and is authorized to administer the FBI Quality Assurance Standards.³⁴

As of 2013, fourteen states and the District of Columbia had passed legislation mandating accreditation and other oversight requirements for at least some forensic service providers, including: Arkansas California, Hawaii, Indiana, Louisiana, Maryland, Massachusetts, Missouri, Nebraska, New York, North Carolina, Oklahoma, Texas, and Washington, D.C.³⁵ Accreditation is required only for laboratories conducting forensic DNA analysis in California, Hawaii, Indiana, and Nebraska; the others require accreditation for a broader set of disciplines.³⁶

The United States State Department runs one of the most robust and professional programs to help labs become accredited. Unfortunately, the program does not run domestically in our country. This program could be modeled for United States domestic labs to the level of support being offered internationally. While accreditation funds are available through the Coverdell granting program, the available funds are not significant enough to cover the need. The Coverdell grants are stretched thin to provide operational funds to the nation's laboratories and medical examiners

Last year the American Society of Crime Laboratory Directors launched an aggressive mentor-based program to offer help to laboratories seeking accreditation. They partnered with the NIJ Forensic Technology Center of Excellence to initially help six laboratories obtain accreditation in a two-year period. Making tool kits, providing mentors, and supplying initial accreditation funding is essential to seeing even more labs become accredited.

While accreditation funds are available through the Coverdell granting program, the available funds are not significant enough to cover the need. Most large laboratories will

³³ National Science and Technology Council, Committee on Science, Medicolegal Death Investigation Working Group (MDI WG), *Strengthening the Medicolegal-Death-Investigation System: Accreditation and Certification-A Path Forward*, December 2016, p. 3. https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/mdi_wg_-_accreditation_and_certification_white_paper_1.6.pdf.

³⁴ <https://www.a2la.org/accreditation/forensics>.

³⁵ <http://www.ncsl.org/Documents/cj/AccreditationOfForensicLaboratories.pdf>.

³⁶ National Science and Technology Council, 2014, p. 5.

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spend tens of thousands of dollars each year on accreditation expenses and ancillary requirements such as proficiency testing, security, and quality assurance. Most small labs will pay between five and ten thousand dollars a year for accreditation inspections and fees.

CERTIFICATION

My home state of Idaho was the first laboratory system in the country to require all analysts to be certified. We have required certification for somewhere over twelve years. Other labs have followed suit, and now some states require analysts to be certified or licensed. The requirement for analyst certification is supported by many forensic science organizations³⁷

“Analyst certification is recognition by an external organization that an individual has acquired and demonstrated specialized knowledge, skills, and abilities in the standard practices necessary to perform duties and produce valid forensic findings. While accreditation is a quality assessment of a crime lab, certification is a quality assessment of an individual. External certification programs may assess analysts through exams, proficiency testing, evaluation of education, training and practical experience, adherence to codes of ethics, and other standards.”³⁸ Certification compliments accreditation as a means of ensuring the validity and reliability of test results and enhancing public confidence in the judicial system.³⁹

In 2014 the SoFS reported that:

Professional certification bodies focused on the forensic sciences have existed for more than 30 years. Forensic science certification bodies typically focus on one or a few related forensic science disciplines, but there is not a certification body or process for every discipline or category of forensic testing. Those bodies that do exist vary considerably in terms of their eligibility requirements, use of proficiency test and practical exercises, provision of training and continuing education, and requirements for recertification, among other variables. As a result, the certification landscape for the forensic sciences is fragmented, with inconsistencies apparent even among certification programs accredited by the same entity. While many of these differences may be appropriate due to the considerable variability of skill sets required among the different

³⁷ ASCLD states in their National Outreach Priority Agenda that “ASCLD supports the certification of all forensic science professionals, if appropriate certification programs exist.” <https://www.asclد.org/wp-content/uploads/2018/10/2018-2019-ASCLD-NOPA.pdf>.

³⁸ <https://www.bjs.gov/content/pub/pdf/pffclqap14.pdf>.

³⁹ NAT’L SCI. & TECH. COUNCIL’S SUBCOMM. ON FORENSIC SCI., STRENGTHENING THE FORENSIC SCIENCES (2014) p. 9.

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forensic disciplines, the forensic science field could benefit from a more standardized and comprehensive approach to certification.⁴⁰

Today, however, there are accreditation bodies that accredit certifying organizations. For example,

The Forensic Specialties Accreditation Board (FSAB) was created in 2000 as a voluntary program to assess, recognize, and monitor such specialty boards/certification bodies. The FSAB reviews and evaluates the operating procedures and standards of applicant forensic certification bodies to ensure that minimum standards are met. FSAB accreditation standards are modeled on ISO/IEC 17024, an international standard designed to ensure the validity, reliability, and quality of certification programs. For example, a certification body accredited under ISO/IEC 17024 must demonstrate a fair and equitable evaluation of all candidates; an organizational structure appropriate to the task of supporting its mission; policies and procedures for handling complaints, appeals, and confidentiality requirements; and a certification and recertification scheme.⁴¹

FSAB is currently in the process of transitioning to ISO/IEC 17011 and to ISO/IEC 17042 compliance. ANSI is another accreditation program that accredits certifying organizations. It is itself accredited under ISO/IEC 17011. FSAB, which accredits only forensic science certification programs, has accredited the following organizations:

American Board of Criminalistics (ABC)
American Board of Medicolegal Death Investigators (ABMDI)
American Board of Forensic Toxicology (ABFT)
Board of Forensic Document Examiners (BFDE)
American Board of Forensic Document Examiners (ABFDE)
International Board of Forensic Engineering Sciences (IBFES)
American Board of Forensic Odontology (ABFO)
American Board of Forensic Anthropology (ABFA)
International Association of Computer Investigative Specialists (IACIS)
Certified Fire Investigator Board, International Association of Arson Investigators (IAAI)

The International Association for Identification (IAI), which is currently applying for accreditation by ANSI, and the Association of Firearm and Tool Mark Examiners (AFTE) also certify individuals. The chart below lists the areas of certification and the number of certificants for these certifying bodies.

⁴⁰ NAT'L SCI. & TECH. COUNCIL'S SUBCOMM. ON FORENSIC SCI., STRENGTHENING THE FORENSIC SCIENCES (2014) p. 9.

⁴¹ NAT'L SCI. & TECH. COUNCIL'S SUBCOMM. ON FORENSIC SCI., STRENGTHENING THE FORENSIC SCIENCES (2014) pp. 9-10. The FSAB was created by the joint efforts of AAFS and NIJ.

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CERTIFYING ENTITY	SUBJECT AREAS	TOTAL NUMBER OF CERTIFICANTS
American Board of Criminalistics (ABC)	Comprehensive Criminalistics Examination Drug Analysis Molecular Biology Fire Debris Analysis Hairs and Fibers Paints and Polymers	1,078 ⁴²
American Board of Medicolegal Death Investigators (ABMDI)	Medicolegal Death Investigation	1,623 Registry Diplomates 243 Board Certified ⁴³
American Board of Forensic Toxicology (ABFT)	Toxicologist in the measurement of alcohol, drugs and other toxic substances in biological specimens and interpretation of such results in a medicolegal context	465 ⁴⁴
Board of Forensic Document Examiners (BFDE)	Forensic Document Examiners	10 ⁴⁵
American Board of Forensic Document Examiners (ABFDE)	Forensic Document Examiners	100 ⁴⁶
International Board of Forensic Engineering Sciences (IBFES)	Engineering sciences	17 ⁴⁷
American Board of Forensic Odontology (ABFO)	Forensic dentists	87 ⁴⁸
American Board of Forensic Anthropology (ABFA)	Forensic anthropology	91 ⁴⁹

⁴² <http://www.criminalistics.com/certification.html>.

⁴³ Personal communication between ABMDI and Ken Melson 9/6/19.

⁴⁴ abft.org.

⁴⁵ Personal communication between BFDE and Ken Melson 9/6/19.

⁴⁶ Personal communication between ABFDE and Ken Melson 9/6/19.

⁴⁷ <https://www.ibfes.org/news-and-publications>

⁴⁸ Personal communication between ABFO and Ken Melson on 9/6/19.

⁴⁹ theabfa.org.

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International Association of Computer Investigative Specialists (IACIS)	Certified Forensic Computer Examiner (CFCE)	1832 ⁵⁰
International Association of Arson Investigators (IAAI)	Certified Fire Investigator	Approximately 2,164 ⁵¹
Association of Firearm and Tool Mark Examiners (AFTE)	Firearms Tool marks GSR/Distance examinations	148 ⁵²
International Association for Identification	Bloodstain Pattern Analyst Certification Footwear Certification Forensic Art Certification Forensic Photography Certification Forensic Video Certification Latent Print Certification Tenprint Fingerprint Certification Crime Scene Certification	3,059 ⁵³

Although in 2014, 72% of crime labs employed at least one externally certified analyst,⁵⁴ more practitioners need to be certified by a recognized certification body. Universal certification has several monetary and human capital costs. One of those challenges includes the fact that some practitioners perform examinations in different disciplines. To be certified in each testing area would incur significant cost and time concerns for the individual. Forensic science service providers also would have to accommodate the needs for time and resources of its employees to prepare for the certification examinations, and for alternative ways of meeting examination deadlines without employing additional examiners. Other challenges also exist.⁵⁵

COGNITIVE BIAS

The NAS report also recommended research on human observer bias and sources of human error in forensic examinations. Even before the NAS report, there were studies conducted on issues such as confirmation bias and context bias. After 2009 there were numerous studies and peer-reviewed articles on cognitive bias, many by Itiel Dror. His research conducted with other well-known forensic researchers can be found at

⁵⁰ <https://members.iacis.com/cfce>, as of 12/31/18.

⁵¹ <https://www.firearson.com/uploads/CFIsforweb04032019.pdf>.

⁵² <https://afte.org/afte-certification/certified-member-roster>.

⁵³ Personal communication between IAI and Ken Melson, 9/13/19.

⁵⁴ <https://www.bjs.gov/content/pub/pdf/pffclqap14.pdf>.

⁵⁵ See <https://www.bjs.gov/content/pub/pdf/pffclqap14.pdf>.

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<https://www.ucl.ac.uk/~ucjtidr/> . Procedures have been implemented in many laboratories to minimize cognitive bias. For example, sequential unmasking is used to prevent the practitioner from seeing domain irrelevant information, and examinations are conducted in a linear fashion so that the crime scene evidence is examined before the known exemplars from the defendant and others.

Many laboratories, associations, and OJP funded grantees have had training in cognitive bias. OSAC has a Human Factors Committee that provides guidance on the influence of systems design on human performance, ways to minimize cognitive and confirmation bias, and ways to mitigate errors in complex tasks. Itiel Dror spoke at the AAFS Annual Meeting in February 2018 at the plenary session, and the National Clearinghouse for Science Technology and the Law presented a two-hour webinar on cognitive bias by Dr. Dror in 2019. There were 419 registrants for the webinar, and 244 views since the webinar was posted. The concept of cognitive bias is well-known in the forensic laboratories because of internal and external training, the work of the OSAC, and other initiatives. All forensic practitioners need to be trained in this subject, and funding would assist in accomplishing this goal.

PROFICIENCY TESTS

Proficiency testing is almost universally implemented in the publicly funded crime laboratories surveyed by BJS in its 2014 *Publicly Funded Forensic Crime Laboratories: Quality Assurance Practices*, 2014. It reported that 98% of the crime labs conducted proficiency testing in 2014. Proficiency testing is an important quality control process that measures the performance of crime laboratory personnel and the forensic science service provider itself. The tests help determine whether generally accepted practices are used and whether laboratory accreditation protocols are being followed. These proficiency tests are administered through internal or external declared tests, blind tests, random case reanalysis or interlaboratory testing. Blind proficiency testing is preferred, but in 2003 a DOJ panel reported that, after creating blind tests and evaluating them, that it would cost \$500,000 to \$1 million annually for one test per laboratory.⁵⁶

The proficiency test providers used by laboratories for the accreditation-required proficiency tests are in turn accredited by ANAB pursuant to ISO/IEC 17043:2010.⁵⁷ One challenge to using external proficiency tests relates to those instances in which there are few practitioners conducting examinations in a particular discipline. In such cases, proficiency test providers may not see a cost-benefit in developing and disseminating those types of tests to a small group of practitioners. Federal grants for development of proficiency tests in those areas would increase the disciplines in which practitioners can be tested.

⁵⁶ NAS report, p. 207.

⁵⁷ <https://www.anab.org/forensic-accreditation/proficiency-testing>.

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QUALITY ASSURANCE AND QUALITY CONTROL

Accredited laboratories have quality assurance and quality control processes in place. As the NAS report stated, accreditation “means that the laboratory adheres to an established set of standards of quality and relies on acceptable practices within these requirements. An accredited laboratory has in place a management system that defines the various processes by which it operates on a daily basis, monitors that activity, and responds to deviations from the acceptable practices using a routine and thoughtful method.”⁵⁸

Accreditation requirements include written methods, protocols, validation, calibration, the use of positive and negative controls, corrective actions, among others. Accreditation means the laboratory has a quality management system in place. Most importantly, accredited laboratories require a Quality Assurance Manager (however named) to oversee the quality assurance and quality controls used in the laboratory. Many Quality Assurance Managers belong to the Association of Forensic Quality Assurance Managers (AFQAM). As that association states, its mission is to promote standardized practices and professionalism in quality assurance management for the forensic community.⁵⁹

Quality Assurance Managers have started to network more with colleagues in other industries, especially in the area of risk assessment and management. Training is being regularly offered to laboratory staff on quality management principles and practices. The OSAC has a very active Quality Infrastructure Committee comprised of current or former quality managers and quality management experts. AFQAM partnered with the American Society for Quality (ASQ) to provide more quality assurance resources to laboratories.

CODE OF PROFESSIONAL RESPONSIBILITY

The AAFS and the CFSO agree that all forensic scientists should be subject to a code of professional responsibility. In 2014, 94% of crime laboratories surveyed by BJS maintained a written code of ethics. They either create their own code or adopt a code from their accreditation body or other source.⁶⁰ Many forensic scientists are under more than one code — their own code, ANAB’s code, and codes of associations to which they belong. ANAB has a code of professional responsibility for all accredited laboratories: Guiding Principles of Professional Responsibility for Forensic Service Providers and Forensic Personnel.⁶¹ In addition, most forensic science associations, to which many practitioners belong, have codes of professional responsibility and ethics.⁶²

⁵⁸ NAS report, page 195.

⁵⁹ <https://www.afqam.org/wp15/>.

⁶⁰ BJS *Publicly Funded Forensic Crime Laboratories: Quality Assurance Practices*, 2014.

⁶¹ <https://anab.qualtraxcloud.com/ShowDocument.aspx?ID=6732>.

⁶² See Melson, K. *Codes of Ethics in Forensic Science Societies: The Organizational Parameters of Morality and Conduct* in Downs J.C. and Swienton, A. eds. *Ethics in Forensic Science*, Elsevier, 2012, Chapter 4.

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The SoFS also reviewed and studied codes of professional responsibility. It found that the existing codes there were four major categories of ethical assurance usually addressed by them. They were: “the need to (1) work within the parameters of one’s professional competence; (2) provide clear and objective testimony; (3) avoid real or perceived conflicts of interests; and (4) avoid real or perceived bias and or susceptibility to outside influences”. The Subcommittee on Forensic Science also found that the ASCLD/LAB (now ANAB) Guiding Principles of Professional Responsibility for Crime Laboratory and Forensic Scientists” code addressed all four of the assurances. The NCFs working group on a national code of professional responsibility recommended that the ASCLD/LAB document be adopted as the National Code of Ethics and Professional Responsibility for the Forensic Sciences. The Interim Solutions Subcommittee of the National Commission on Forensic Sciences utilized this code as its starting point for a National Code of Professional Responsibility for all forensic science and forensic medicine service providers and recommended it for adoption by the Attorney General⁶³. On September 6, 2016, the Attorney General adopted a code of professional responsibility for DOJ laboratories based on DOJ’s Scientific Research and Integrity Policy and the ASCLD/LAB Guiding Principles of Professional Responsibility. ASCLD adopted the Attorney General code of professional responsibility for the membership and encouraged all labs to evaluate their codes of ethics for robustness and enforceability.

A national code has thus been proposed. A code of professional responsibility very similar to the NCFs adopted National Code, is in place in ANAB accredited laboratories that by now includes over 90% of the publicly funded forensic laboratories.

CONCLUSION

I would be remiss if I did not also add that all of these efforts and challenges also affect the medical examiner and coroner community and perhaps more so. The medico-legal death investigation community more than any others has a workforce shortage that has become a national crisis. There are simply very few medical students seeking to become forensic pathologists. As a result, their accreditation is threatened.

As you can see, the community has not only adopted many of the recommendations from a variety of committees, commissions and boards. But the first recommendation of the NAS report, the creation of the National Institute of Forensic Science, has not been formed. The NAS report recognized the creation of this single federal entity would undoubtedly pose challenges, not the least of which is budgetary. Creating an entity funded by existing appropriations from various agencies does not solve the budget problem; it merely passes the fiscal burdens downstream to those agencies, creating in effect a mandate without additional funding. I would argue that the solution may be to use the existing frameworks already in place as a result of the original recommendations that currently create a network of federal, state, local and tribal expertise, interaction and

⁶³ <https://www.justice.gov/archives/ncfs/page/file/839711/download>.
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recommendations for research strategies. Specifically, OSAC and the following entities now participate in the inter-agency development of research needs:

Forensic Laboratory Needs-Technology Working Group (FLN-TWG):

This is a new structure created at DOJ to provide recommendations for technology transfer to the forensic science community and evaluate other needs of state, county, tribal, and local practitioners. FLN-TWG focuses heavily on how the federal government can assist state, county, tribal, and local practitioners with technology, policy, and resource needs.

Forensic Science Technology Working Group:

This NIJ group evaluates and prioritizes the research needs developed by the NIST OSAC and NIJ. It then recommends those programs for funding within the budget constraints of each agency.

Council of Federal Forensic Laboratory Directors (CFFLD):

DOJ reformed this group as an evaluation tool to consider the needs and direction of the federal forensic science service providers from any federal agency. While DOJ administers the group, they also invite all federal forensic science service providers to participate. The CFFLD is also now coordinating between federal agencies for things like research in measurement science, black box and white box research studies, and database development.

With the leadership of agencies like NIST and NIJ, there has developed an increasingly robust research agenda, without the need for a central office in the White House Executive Office. Indeed, having a National Forensic Science Coordinating Office in OSTP would subject the existence of the office to shifts in political winds depending on administration. Legislation requiring research activity and leadership in agencies like NIST, NIJ, and the National Science Foundation (NSF) would ensure to a greater degree the continued existence of national research.

In conclusion, our needs for a successful forensic enterprise are simple.

1. We need the continued support of the federal government to fund efforts to increase forensic laboratory and medical examiner office capacity, capability, and training. Current funding is minimal best. The majority of funding for the above-mentioned efforts come from the Paul Coverdell Forensic Science Act, which also includes operational needs of forensic laboratories and medical examiners. Its highest funding for the program has been \$30 million which covers the entirety of the country's laboratories and medical examiners (See Appendix A);
2. The OSAC was funded by the Department of Commerce only in its initial year. Congress has added the funding each year since then as a pass through from the

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- Department of Justice. OSAC is not now codified, so the existing structure may or may not exist from year to year. OSAC needs to be codified;
3. Laboratory accreditation for forensic laboratories and medical examiners is costly to obtain and to maintain. Laboratories seeking accreditation need dedicated funding from the government;
 4. Certification is important to the reliability of forensic methods but is a burden on laboratories because of personnel costs. The financial support of the federal government to allow laboratories the ability to have their examiners certified would help improve the services of forensic science community.
 5. Research and development efforts, at all levels, are funded at best from year-end unexpended resources that the agencies can compile. However, we do not have visibility into those numbers and are only able to comment from the perspective of solicitations that we see from NIJ and NIST. It is clear, however, that research is needed and that the federal government must take a strong leadership role.

It must also be stressed to this committee that the forensic enterprise (laboratories, toxicologists and medical examiners) are also seeing an unprecedented amount of work coming through our doors due to the opioid crisis.⁶⁴ We don't know the magnitude of our need for resources, but we do know that it is great. A needs assessment of the laboratories and the medical examiners is imminent from the DOJ and we understand that there are dollar figures that have been associated with those needs. I would urge this committee to review those needs assessments while contemplating any new legislation that may affect the operation of our forensic science practitioners.⁶⁵

It is vitally important to the criminal justice system in the United States to properly resource the nation's forensic science. Resources must be allocated so there is an equal access to valid forensic services in all areas of the country. A healthy and robust forensic science service provider network is important in this country to prosecute true perpetrators, exonerate the innocent, and provide closure for victims of crime. We thank you again for this Committee taking this issue seriously and helping us address these serious issues

⁶⁴ See National Science and Technology Council, Committee on Science, Medicolegal Death Investigation Working Group (MDI WG), *Strengthening the Medicolegal-Death-Investigation System: Accreditation and Certification-A Path Forward*, December 2016.

https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/mdi_wg_-_accreditation_and_certification_white_paper_1.6.pdf

⁶⁵ BJS plans to initiate a new Census of Medical Examiners and Coroners' Offices in 2019. The census will collect information on staffing, budgets, caseloads, resources, policies, and procedures of medical examiner and coroners' offices. <https://ojp.gov/resources/ojp-hhs-mdi-wg.htm#bjs-1>.

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APPENDIX A

HISTORIC FUNDING OF FORENSIC SCIENCE

PROGRAM	FY20 (note pending, figures are President budget request only)	FY19	Fy18	FY17	FY16
Paul Coverdell Forensic Science Grants	\$10 m	\$30m	\$30m	\$13m	\$13.5m
DNA Initiative/Debbie Smith DNA Backlog Grants	\$105m	\$120m	\$120m	\$117m	\$117m
Kirk Bloodsworth Post Conviction DNA Testing Grants	\$4m	\$6m	\$6m	\$4m	\$4m
Sexual Assault Forensic Exam Program Grants	\$4m	\$4m	\$4m	\$4m	\$4m
SAKI	\$47.5m	\$48m	\$45m	\$45m	\$45m
OSAC (note funds are transferred from DOJ and have not been requested by the Department of Commerce in their budget for any of the years indicated on this chart)	0	\$4m	\$4m	\$4m	\$3m

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