STRENGTHENING THE FORENSIC SCIENCES

National Science and Technology Council

Committee on Science

Subcommittee on Forensic Science

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL SCIENCE AND TECHNOLOGY COUNCIL
WASHINGTON, D.C. 20502

Dear Colleagues:

We are pleased to release the report "Strengthening the Forensic Sciences." This report represents the first set of research findings and conclusions from the National Science and Technology Council's Subcommittee on Forensic Science, covering issues relating to laboratory accreditation, certification of forensic science and medicolegal personnel, proficiency testing, and ethics. The detailed and comprehensive exploration of modern forensic science embarked on by this Subcommittee has broadened the breadth of foundational knowledge and situational awareness in the agencies, informing a meaningful framework for future analysis and coordination. This report details some of the Subcommittees findings and work products to inform collaborative dialogue on matters that will serve to enhance forensic science policy, research, and practice moving forward.

It is the expectation of the Committee on Science that the material collated here will prove useful to policy makers in government as well as forensic scientists, laboratory managers, and other practitioners working together to strengthen the forensic sciences—and to the recently created National Commission on Forensic Science, which is well-positioned to consider these and other findings as it prepares to provide policy advice to the U.S. Attorney General.

Sincerely,

Philip Rubin, OSTP (Co-Chair, COS) — 5-2-14 Date

France Córdova, NSF (Co-Chair, COS) — 4-30-14 Date

Francis Collins, NIH (Co-Chair, COS) — 5-1-14 Date

About the National Science and Technology Council

The National Science and Technology Council (NSTC) is the principal means by which the Executive Branch coordinates science and technology policy across the diverse components of the Federal research and development enterprise. A primary objective of the NSTC is establishing clear national goals for Federal science and technology investments. The NSTC prepares research and development strategies that are coordinated across Federal agencies to form investment packages aimed at accomplishing multiple national goals. The work of the NSTC is organized through five committees: Environment, Natural Resources and Sustainability; Homeland and National Security; Science, Technology, Engineering, and Math (STEM) Education; Science; and Technology. Each of these committees oversees subcommittees and working groups focused on different aspects of science and technology. More information is available at http://www.whitehouse.gov/ostp/nstc.

About the Office of Science and Technology Policy

The Office of Science and Technology Policy (OSTP) was established by the National Science and Technology Policy, Organization, and Priorities Act of 1976. OSTP's responsibilities include advising the President in policy formulation and budget development on questions in which science and technology are important elements; articulating the President's science and technology policy and programs; and fostering strong partnerships among Federal, state, and local governments, and the scientific communities in industry and academia. The Director of OSTP also serves as Assistant to the President for Science and Technology and manages the NSTC. More information is available at http://www.whitehouse.gov/ostp .

About the Subcommittee on Forensic Science

The purpose of the Subcommittee on Forensic Science (SoFS) 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 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.

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INTRODUCTION

In response to the National Academy of Sciences (NAS) report, *Strengthening Forensic Science in the United States: A Path Forward*,[1] the White House Office of Science & Technology Policy (OSTP) coordinated the establishment of the Subcommittee on Forensic Science (SoFS). It was chartered in July, 2009, and completed its work on December 31, 2012. For 3 years, the SoFS membership actively pursued the investigation and analysis of critical issues that can inform a coordinated and meaningful response to the NAS report. Their detailed and comprehensive exploration has broadened the breadth of foundational knowledge and situational awareness, thereby informing a meaningful framework for analysis. This report details some of their findings and work products that can inform collaborative dialogue on matters that will serve to enhance forensic science policy, research, and practice. Through its analysis, the SoFS recognized that many of the issues under consideration cross-cut multiple recommendations of the NAS report. Accordingly, in many cases, their work products relate to one or more NAS report recommendations. It should be noted that the Administration is extremely active in pursuing all issues that impact forensic science and this report does not represent all work currently being pursued to improve and maximize the value of forensic science in the United States.

The SoFS was comprised of nearly 200 subject matter experts across all levels of government. Participation spanned 23 Federal departments and agencies, including the Department of Commerce, Department of Defense, Department of Health and Human Services, Department of Homeland Security, Department of the Interior, Department of Justice, Department of Treasury, Environmental Protection Agency, National Institutes of Health, National Science Foundation, National Transportation Safety Board, Smithsonian Institution, United States Postal Service, and intelligence community. In accordance with the Federal Advisory Committee Act and the Open Government Directive, which outline the importance of participation and collaboration with state and local government partners, the SoFS engaged 49 advisory members across the its IWGs, a unique process to the NSTC 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.

INTERAGENCY WORKING GROUPS

To carry out the work of the SoFS, four IWGs were chartered to align with the 13 recommendations of the NAS report, and one for the purpose of outreach. The IWG process included receiving information from a multitude of stakeholders including state and local advisory members, national associations and organizations representing the forensic science and medicolegal death investigation communities, academia, private industry, and other entities.

Accreditation, Certification Interagency Working Group (AC IWG)

[1] National Research Council of the National Academies. Strengthening Forensic Science in the United States: A Path Forward, Washington, DC, 2009.

A primary goal of the AC IWG was to consider the recommendation regarding mandatory, universal accreditation for all forensic science providers. The AC IWG also considered implications related to mandatory certification of forensic science service practitioners and the role of proficiency tests as a part of a quality management system.

Standards, Practices, and Protocols Interagency Working Group (SPP IWG)
The SPP IWG considered the very complex issues associated with standards and standards development in forensic science to include standards of practice, vocabulary, and forensic science reports. The group also analyzed the current infrastructure that supports standards development in forensic science and mechanisms for improvement.

Education, Ethics, and Terminology Interagency Working Group (EET IWG)
A main objective of EET IWG was to identify a uniform code of professional responsibility for forensic science practitioners and to consider improvements in undergraduate and graduate degree programs and continuing education programs for forensic science practitioners and the legal community.

Research, Development, Testing, and Evaluation Interagency Working Group (RDT&E IWG)
The RDT&E IWG has 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.

Outreach and Communication Interagency Working Group (OC IWG)
Supporting the efforts of the four other IWGs, OC IWG facilitated the process of gaining input from the public and private sectors. Communicating the issues under consideration by SoFS to relevant constituencies ensured that varying perspectives were considered.

The contents of this report represent the first set of research findings and conclusions from the National Science and Technology Council's Subcommittee on Forensic Science, covering issues relating to laboratory accreditation, certification of forensic science and medicolegal personnel, proficiency testing, and ethics.

1. Accreditation of Forensic Service Providers

The 2009 National Academies report ("NAS report")[2] called for mandatory accreditation of forensic science service providers (in common parlance, "forensic laboratories" or "crime labs"). Specifically, Recommendation 7 of the NAS report states that all laboratories and facilities (public and private) should be accredited, and that the determination of appropriate accreditation standards should take into account established and recognized international standards, such as those published by the International Organization for Standardization (ISO).

The SoFS considered in detail the challenges and implications of implementing this recommendation. For purposes of its review, the SoFS considered the NAS recommendation to encompass all forensic science service providers[3] (defined as having at least one full-time analyst, however named, who examines physical evidence[4] in criminal and/or investigative matters and provides reports or opinion testimony with respect to such evidence in United States courts of law), as well as medical examiner/coroner offices, forensic units, and part-time and private forensic science entities, with the goal that these entities become accredited under appropriate International Organization for Standardization (ISO)-based standards and any supplemental requirements or standards specific to forensic science.[5]

Background

Professional accreditation bodies focused on the forensic sciences have existed for more than 30 years. In general, accreditation increases confidence in the reliability and accuracy of data produced, conclusions rendered, and services provided. More specifically, *laboratory* accreditation is the recognition of technical competence through an independent third-party assessment of a laboratory's quality, administrative, and technical systems.[6] The laboratory accreditation process provides a thorough evaluation of laboratory policies and procedures as measured against international standards. Laboratories use the accreditation process to assess their level of performance by means of external audits and to strengthen their operations, and to provide the general public and potential customers with a means of identifying those laboratories that have demonstrated compliance with established standards.

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[2] National Research Council of the National Academies. Strengthening Forensic Science in the United States: A Path Forward, Washington, DC, 2009.
[3] In this document the term forensic science service provider may be used interchangeably with forensic laboratory.
[3] Physical evidence is a term used in the definition of a crime/forensic laboratory in the American Society of Crime Laboratories Directors/Laboratory Accreditation Board - *International*, Supplemental Requirements for the Accreditation of Forensic Science Testing Laboratories, Appendix A – Glossary, 2011 and the Bureau of Justice Statistics Bulletin, *Census of Publicly Funded Forensic Crime Laboratories*, *2005*, July 2008NCJ 222181, U.S. Department of Justice, Office of Justice Programs, p. 9.
[5] ISO/IEC 17025, General Requirements for the Competence of Testing and Calibration Laboratories, ISO/IEC 17020, General Criteria for the Operation of Various types of Bodies performing Inspection and, ISO/IEC 15189, Medical laboratories - Particular requirements for quality and competence.
[6] Why become an Accredited Laboratory, ILAC publications, 2010.

In the case of forensic laboratories, accreditation to the recommended standards demonstrates that the provider is compliant with industry-established criteria to perform specific types of testing and/or examination, measurement, or calibration activities and produce data that are accurate, traceable to standards, and reproducible. Implementation of a quality management system, as required by ISO accreditation standards, is a sensible strategy to help decrease the likelihood of errors in testing results, data interpretation, and opinions. Properly implemented, forensic laboratory accreditation serves each of the core stakeholders in the criminal justice system -- the prosecution, the defense, and the judiciary -- and increases public trust in the criminal justice system.

Laboratory accreditation uses specific, widely accepted criteria, standards, and procedures to ensure that a laboratory is competent to generate and interpret results that are reliably accurate and based on industry best practices. Ultimately, accreditation is a measure of the adequacy of management practices, including staff competence, training and continuing education; validity and appropriateness of test methods; traceability of measurements and calibrations to national standards; suitability, calibration, and maintenance of test equipment; testing environment; documentation, sampling, and handling of test items; and quality assurance of data including the reporting of results and proficiency tests. External assessors conduct an evaluation of all aspects of a laboratory's operations that affect data, laboratory products, and services; they also evaluate laboratory compliance to applicable standards and the laboratory's documented policies and procedures. The accreditation body reviews the assessment report and monitors any remediation to ensure the appropriate corrective actions are implemented. Laboratory accreditation also includes periodic surveillance by the accreditation body for continued compliance with requirements. Failure to maintain these standards can result in the accrediting body suspending or revoking the accreditation of the laboratory.[7]

It is important to acknowledge that while accreditation is a foundational component of an organization's quality assurance program, it is not a panacea for the various shortcomings in forensic science practices identified by the NAS and others. As the NAS report noted, "accreditation does not mean that accredited laboratories do not make mistakes, nor does it mean that a laboratory utilizes best practices in every case." Even in cases involving accredited laboratories, for example, legal disputes may arise over the appropriate level of transparency or disclosure of such information as protocols, standard operating procedures, audit and accreditation results, proficiency test results, and validation studies—disputes that will generally be resolved not by laboratory standards but by lawyers and judges. Nonetheless there is little doubt that universal accreditation of forensic science service providers would have a salutary impact both on the validity of forensic testing and the level of public trust in the forensic evidence brought to bear in the courtroom.

[7] The Advantages of Being an Accredited Laboratory, ILAC Publications, 2010.

Current Status

The accreditation landscape for forensic providers is quite variable today, with approximately 25% of Federal laboratories unaccredited but the vast majority of the approximately 400 non-Federal, publicly funded crime laboratories accredited. (See Appendices 1B-E.) Specifically, in a July 2008 report, The Bureau of Justice Statistics (BJS) identified 389 publically funded (i.e., Federal, state, or local) forensic crime laboratories operating in the United States (as of 2005), more than 85 percent of which were accredited. The SoFS identified an additional 86 forensic laboratories not included in the BJS survey. Of the total number of providers included in the two tallies combined, the SoFS identified 86 that were unaccredited. As of early 2009, per inquiries made by the SoFS encompassing both publicly and privately funded laboratories, the American Society of Crime Laboratory Directors / Laboratory Accreditation Board (ASCLD-LAB) had accredited 320 and Forensic Quality Services, Inc. (FQS) had accredited 56.

In recent years, several states[8] have passed legislation mandating accreditation and other forms of oversight of forensic science service providers, and a growing number of local forensic laboratories have also achieved accreditation, but relevant legislation and other oversight requirements vary greatly from state to state and among local jurisdictions. So while the current level of accreditation among state[9] and local laboratories is a sign of significant progress compared to the past, the current level is evidence that voluntary accreditation policies are unlikely, by themselves, to deliver on the NAS's recommendation of universal accreditation.

Accreditation rates also remain low among medical examiner/coroner (ME/C) offices and forensic toxicology laboratories. In general, ME/C accreditation attests that an office has a functional governing code; adequate staff, equipment, and training; and a suitable physical facility, and produces accurate, credible death investigation products. But of the 2,342 ME/C offices serving 3,343 counties in the United States (as of 2004) only 45 were accredited by the primary such accreditor (the National Association of Medical Examiners) and 9 by the International Association of Coroners and Medical Examiners (as of January 2011). And of the approximately 200 U.S. toxicology laboratories, only 23 were accredited by the currently available accreditor, the American Board of Forensic Toxicology, as of January 2011. (The SoFS was not able to determine how many of the 200 perform forensic toxicology work.) While these three accrediting bodies are extensively accepted within the community and their standards have been generated by distinguished professional organizations, none of the three is currently using ISO standards.

Challenges

Two major challenges to achieving the NAS goal of universal accreditation for forensic science providers are the diversity of disciplines—and, therefore, the diversity of tests—that fall under the general forensic science rubric, and the range of settings in which these services are provided. With regard to the former,

[8] As of January 12, 2011, nine states have passed legislation as detailed in Appendix B

[9] The term "State" means each of the 50 states, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, Guam, and the Commonwealth of Northern Mariana Islands.

forensic science practitioners have self-organized into more than 20 specific disciplines focused on the analysis of evidence related to firearms, arson, fibers and hairs, impressions, questioned documents, fingerprints, tool marks, and DNA. With regard to the latter, the forensic science community includes, but is not limited to, public laboratories and forensic units; medical examiner and coroner offices; and other providers including private laboratories, individual practitioners, and academicians.

An additional significant challenge is that, of the estimated 7,000 to 10,000 U.S. forensic units employing 35,000 to 50,000[10] individuals—predominately in law enforcement agencies and for the most part providing limited forensic science services—there is no reliable tally of how many meet the definition of a forensic science service provider—and which of these might appropriately fall under the NAS's interpretive rubric for universal accreditation.

One of the biggest hurdles facing the forensic community is identifying providers of forensic science services outside of the groups named above. The most comprehensive approach to increasing standardization within the forensic sciences—and the simplest in terms of policy, if not the simplest to implement—would be to make all entities performing forensic testing, even on a part-time basis, subject to mandatory accreditation requirements. Under the terms of currently enacted state statutes, many of these providers today are not subject to mandatory accreditation requirements and may be exempt from other forms of oversight. The NAS report acknowledged the challenge of identifying these providers, noting that there are insufficient data available on the number and expertise of forensic examiners who are not employed in publicly funded forensic science laboratories.[11]

Another set of challenges to achieving the NAS report's accreditation goals relate to the financial and other impacts that accreditation requirements would have on forensic science service providers, medical examiner/coroner offices, and other providers of forensic services, whether they are seeking initial accreditation or they are transitioning to ISO accreditation. (See Appendix 1A for estimated costs of achieving and maintaining accreditation.) Establishment of the necessary quality management systems can require significant financial and human resources; would have to be achieved in compliance with relevant government policies and regulations relating to purchasing, contracting, hiring, budget cycles, etc.; and could impact the timeliness of services provided during implementation. Ultimately, some forensic science service providers might choose to eliminate or reduce services rather than seek accreditation, resulting in a shift of caseload, testimony responsibilities, and travel to other entities. The consequential shift in crime laboratory management priorities to improve quality could, in turn, have substantial impacts on overall forensic science services provided by the laboratory, including an increase in turnaround times and backlogs.

[10] There is insufficient data available to provide the exact number of forensic units. This is an estimate based on information obtained from various accrediting bodies, law enforcement agencies and professional organizations. Formal surveys to obtain more exact figures have been initiated, but have not been completed as of this writing.
[11] National Research Council of the National Academies. Strengthening Forensic Science in the United States: A Path Forward, Washington, DC., 2009. p. 64

Another challenge to implementing the NAS's accreditation recommendation is that there is no single Federal department, agency, or office that has clear responsibility or control over the relevant issues. While the Department of Justice has primary responsibility for ensuring the quality of the work performed in Federal forensic laboratories, it has limited and indirect power over state and local providers of forensic science services, which comprise the vast majority of such facilities in the United States. Moreover, other Federal entities have equities and/or potential roles to play with regard to the reliability of forensic laboratory testing, including the National Institute of Standards and Technology within the Commerce Department, the Department of Homeland Security; the Department of Defense, and various offices within the Executive Office of the President, including the Office of Science and Technology Policy, which has broad responsibilities for scientific integrity across the Executive Branch. Any effort to implement the NAS recommendations relating to accreditation (as well as for certification of examiners and other aspects of the NAS report) will require coordination among these various stakeholders, as well as with stakeholders in the private sector, including professional organizations and advocacy groups. Among the non-Federal organizations that the SoFS worked with to craft this White Paper and would have stakes in any changes to current accreditation requirements are: the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB); the Forensic Quality Services Inc. (FQS-I); the American Association for Laboratory Accreditation (A2LA); National Association of Medical Examiners; the American Board of Forensic Toxicology; the Uniform Law Commission (ULC); the National Conference of State Legislatures (NCSL); the National Governors Association (NGA); and local, state, regional, and private forensic science service providers.

Another challenge to achieving the NAS's accreditation goals relates to the accrediting process itself—that is, the possible need to develop, in some cases, new standards for accreditation as well as new educational materials, and the possible need to increase the capacity of current accrediting bodies. Offsetting this challenge, the SoFS has worked under the presumption that providers that render opinions based only on the review of data from examinations conducted by other entities would be exempt from accreditation requirements, and accreditation would not be required for specialty examinations conducted outside of the major forensic science disciplines.

Implementation

Independent of the question of how best to overcome the above challenges, the SoFS identified three possible approaches to implementing the NAS recommendation on accreditation, but stopped short of performing a detailed comparison of the pros and cons of each.

One approach is to work with Congress to pass legislation requiring a broad but well-defined set of forensic science service providers (such as "all entities that provide forensic science services in disciplines and categories of testing recognized by forensic science accrediting bodies") to become accredited within a time certain, enforceable by various means. Legislative language along these lines has been crafted in recent years but has not emerged out of the relevant committees.

A second approach is to work with a broad array of stakeholders—including the Uniform Law Commission, National Governors Association, National Committee of State Legislators, and the forensic science community—to craft a uniform law that mandates accreditation, with the goal of getting states to adopt this law across the Nation.

A third approach is for the Department of Justice to mandate accreditation for all laboratories under its direct control and, for laboratories over which direct control is absent, mandate accreditation as a prerequisite for certain financial and other benefits (such as training opportunities or federal funding) that normally accrue to providers from the Department.

A fourth approach is to utilize portions of some or all of the first three approaches in a well-integrated fashion and federal, state and local collaboration. This hybrid approach might afford the opportunity to span the entire national forensic science community in case there would be coverage gaps in any of the individual approaches described above.

Each of these approaches has its own constellation of costs and benefits, which deserve careful study, but all would ultimately have to address the need for funding in support of accreditation (including program administration, technical assistance, and education and training).

2. Certification of Forensic Examiners

The 2009 NAS report concluded that "certification of forensic science professionals should be mandatory" and recommended that "certification requirements should include, at a minimum, written examinations, supervised practice, proficiency testing, continuing education, recertification procedures, adherence to a code of ethics, and effective disciplinary procedures."

In general, professional certification is the recognition by an independent certification body that an individual has acquired and demonstrated specialized knowledge, skills, and abilities in the standard practices necessary to execute the duties of his or her profession. Professional certification programs can feature an array of components, including proctored written and/or practical testing; an evaluation of education, training and practical experience; requirements for continuing education; and adherence to a code of ethics, and can be tailored as appropriate to match the responsibility, activity, or function to be performed. More specifically, in the case of forensic science professionals, certification can complement accreditation as a means of ensuring the validity of test results and enhancing public confidence in the judicial system. Certification is generally considered to be a quality assessment of an individual practitioner in contrast to accreditation, which is generally considered to be a quality assessment of a service provider laboratory facility.

Background

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 tests 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 (see Table 1 below). While many of these differences may be appropriate due to the considerable variability of skill sets required among the different forensic disciplines, the forensic science field could benefit from a more standardized and comprehensive approach to certification.

A significant shortcoming with regard to forensic science certification today is that no fully independent accrediting body (i.e., one that exists outside the field of forensic science itself) exists to assess and, as appropriate, give its imprimatur to worthy forensic science-related specialty boards that confer certification. 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. But while FSAB standards are modeled on ISO/IEC 17024, its standards are not actually recognized by ISO/IEC 17011, which offers accreditation under ISO/IEC 17024, or by any other third party. (The American National Standards Institute, or ANSI, is the only accrediting body recognized by ISO/IEC 17011 that offers ISO/IEC 17024.) Thus the current approach to certification in the forensic science domain is lacking both in terms of the gaps that exist among some subspecialties and in terms of the level of independent evaluation of existing processes and programs. (See Appendix 2A for a listing of discipline-specific testing categories with notation of those accredited by the FSAB.)

It should be noted that a number of unique issues and challenges arise with regard to professional certification of medicolegal personnel such as medical examiners and coroners—a topic raised separately by the NAS report. The SoFS addresses those issues in Chapter 3 of this report.

Current Status

The number of professionally certified forensic science practitioners is small compared to the estimated number of forensic scientists employed by traditional forensic science service providers. As shown in Appendix 2A, there are approximately 8,700 certified forensic science practitioners. Slightly over 5,500 of these practitioners are associated with digital evidence and photography, many of whom are associated with corporations. Although these figures represent a significant achievement in support of certification in the digital evidence field, it also highlights the low number of other, more traditional forensic science practitioners who have achieved this measure of professional standing. Moreover, the 8,700 figure mentioned above does not include those practitioners who work outside of the traditional forensic science services, including, for example, nurses, psychologists, engineers, and evidence handlers. And determining the number of forensic science practitioners within the broad definitional field that includes those working in public (Federal, state, and local) and private laboratories, as well as consultants and others working in the full range of scientific disciplines, has proven difficult. While there is a need to resolve this issue, there are few resources available to help make a reliable estimate. The 2009 BJA survey tallied 13,100 full-time employees within responding, publicly funded forensic crime laboratories. The respondents in the BJA survey further reported that, of those 13,100 employees, 60% were examiners, 9% were technical support, and 14% were managers. The remaining personnel held other support positions. It is estimated from the percentages that there are approximately 10,873 practitioners that may be eligible for certification, but this estimate is likely extremely low, given the modest number of entities that responded to the BJA survey. Indeed, communication with the forensic science accrediting bodies disclosed they estimated there are 35,000 to 55,000 forensic science practitioners across the United States. (This estimate is based on data provided by accredited forensic science server providers, which are required to collect and report data on the number of specific forensic science practitioners.) Based on these and other data the SoFS deduces that of all forensic science practitioners, perhaps 16

percent to 25 percent are certified and this range drops to approximately 6 percent to 9 percent if those practitioners in digital evidence are removed from the calculations.

Challenges

Achievement of the NAS's goal of universal certification for forensic science practitioners is arguably more challenging than achievement of its goal of universal forensic science service provider (laboratory) accreditation, in large part because of the number of disciplines for which certification standards and processes would need to be developed and the multiple levels of certification that may be required even within individual disciplines, such as for managers, analysts, and technical support.

A related challenge is that the development of certification standards and practices (including training and examinations) may not be cost effective or otherwise practical for disciplines in which relatively few practitioners exist. As a general rule in the certification community, it is difficult to create and maintain a certification program for fields with fewer than 50 practitioners. (See Appendix 2A for estimates of the number of certified practitioners in various forensic science disciplines today.)

For disciplines deemed in need of certification programs but that do not already have curricula and educational materials developed, those products would need to be developed through an authoritative process and, ideally, the contents made openly accessible to facilitate the development of training products by third-party developers. As a related challenge, certification bodies may be called upon to develop a "basic forensic science" certification for practitioners working in disciplines for which no certification program exists.

If new certification requirements were implemented, forensic science service providers would have to accommodate employees' needs for time and resources to prepare for the relevant examinations and exercises; rework position descriptions to include certification requirements as appropriate; and, to the extent practicable, provide alternative means of training and educational support for practitioners working in areas where no certification is available. They may also need to modify pay scales to appropriately recognize practitioners who obtain certification.

Another challenge is that, under universal certification rules, a number of forensic science practitioners would be required to obtain multiple certifications representing the different testing categories in which they perform examinations. The time and cost demands posed by multiple certification processes may dissuade some practitioners from qualifying in all the areas in which they currently practice, and could result in a loss of expertise in certain areas. Provisions may have to be made to accommodate longstanding practitioners who do not meet new certification requirements.

As noted above, an additional challenge is that of bringing existing (and any newly created) certification bodies into compliance with ISO/IEC 17024. In many cases this would require the development of new categories of testing, and new collaborations with an entity recognized by ISO/IEC 17011.

Finally, as certification programs and requirements mature, accrediting bodies for forensic science service providers would need to change their standards to consider the certification status of practitioners as part of the accreditation process. Laboratory accrediting bodies may also have to take responsibility for providers documenting adherence to certification requirements.

All of the above challenges carry monetary and human capital costs. And as is the case of the NAS report's call for universal accreditation of forensic laboratories, the NAS's goal of universal certification among forensic science practitioners will be challenging to meet in part because there is no single Federal department, agency, or office that has clear responsibility or control over the relevant issues and costs. While the Department of Justice has responsibility for providing assistance to state and local law enforcement agencies and their crime laboratories, it has limited and indirect power over state and local providers of forensic science services, which comprise the vast majority of such facilities in the United States. Moreover, other Federal entities have equities and/or potential roles to play with regard to the reliability of forensic laboratory testing and practitioner proficiency, including the National Institute of Standards and Technology within the Commerce Department, the Department of Homeland Security; the Department of Defense; and various offices within the Executive Office of the President, including the Office of Science and Technology Policy, which has broad responsibilities for scientific integrity across the Executive Branch. Any effort to implement the NAS recommendations relating to certification (as well as for accreditation and other aspects of the NAS report) will require coordination among these various stakeholders, as well as with stakeholders in the private sector, including professional organizations and advocacy groups. Among the non-Federal organizations that the SoFS worked with to craft this White Paper and would have stakes in any changes to current certification requirements are: the American Board of Criminalistics (ABC), International Association for Computer Information Systems (IACIS), International Association for Identification (IAI), American Society for Testing and Materials (ASTM) International, Institute for Credentialing Excellence (ICE), Idaho State Police Forensic Services, American National Standards Institute (ANSI), American Society for Clinical Pathology Board of Certification (ASCP), American Society for Quality Certification (ASQ), and the Forensic Specialties Accreditation Board (FSAB).

Table 1: Variations in the Requirements of Three Accredited Certifying Bodies (CB)

Requirement	CB#1	CB#2	CB#3
Degree		X	X
Experience	X	X	X
Written exam (initial)	X	X	X
Practical exam (initial)	X	X	X
Oral demonstration (initial)	X*		X^
Continuing education	X	X	X
Re-testing	X		

* transcript or moot court; ^ specific to practical exam

Implementation

The implementation of a universal requirement for certification of forensic science practitioners is an exceedingly complex issue because of the large number of individuals performing such a broad array of duties who would be covered by such a provision. U.S. forensic science service providers and forensic units employ an estimated 35,000 to 50,000[12] individuals today, predominately in law enforcement agencies, with most of these individuals providing limited forensic science services and the wide array of other stakeholders, including private entities and government agencies at the local, state, and Federal level.

Congressional action may be required to achieve effectively the NAS goal of universal certification across the forensic sciences. But the development of certification programs need not wait for legislation and could be encouraged by administrative actions aimed at incentivizing progress towards this goal, including provision of grant funding for the development of curricula, training, and testing.

The total cost of achieving universal certification of forensic science service practitioners is very difficult to estimate given the large uncertainties described above, including the number of practitioners that would be captured by any such requirement, the number of certification programs that might need to be developed for disciplines that do not currently have such programs in place, and the costs of achieving compliance with ISO/IEC 17024. Appendix 2A includes some of the services and fee schedules provided by various certifying bodies to the SoFS in 2011, which may be useful in efforts to estimate the full costs of implementing a universal certification regimen.

[12] There is insufficient data available to provide the exact number of forensic units. This is an estimate based on information obtained from various accrediting bodies, law enforcement agencies and professional organizations. Formal surveys to obtain more exact figures have been initiated, but have not been completed as of this writing.

3. Certification of Medicolegal Personnel

The 2009 NAS report calls for the replacement of what it refers to as today's "hodgepodge" medicolegal death investigation system with a new system in which such investigations are led by certified medical examiners and all medicolegal autopsies are performed or supervised by board-certified forensic pathologists. To achieve this goal, it calls for the development of new standards for best practices, administration, staffing, education, training, and continuing education for competent death scene investigation and postmortem examinations; accreditation of all medical examiner offices pursuant to agreed-upon standards; and restriction of federal funding to only those offices that are accredited or can demonstrate significant and measurable progress toward achieving accreditation within prescribed deadlines.

Professional certification is the recognition by an independent body that an individual has acquired and demonstrated specialized knowledge, skills, and abilities in the standard practices necessary to execute the duties of his or her profession; it provides a means of identifying those practitioners who have successfully demonstrated competency in the domain relevant to their area of practice. A number of reports over a period of decades have concluded, like the NAS, that certification of all U.S. medicolegal death investigation personnel would increase the quality of services provided by death investigators in the two major domains in which their work is applied: in the criminal justice system, where death investigators identify and document pathologic findings in suspicious or violent deaths and in many cases testify in courts as expert medical witnesses; and in the public health system, where death investigators scour health data in search of early evidence of outbreaks or other health-related trends. Through its trustworthy validation of professional qualifications, certification of medicolegal death investigation personnel could also enhance public confidence in the criminal justice and public health systems.

Background

In the United States, the medicolegal death investigation profession comprises three major personnel categories: medicolegal death investigators, coroners, and medical examiners. There are no nationally mandated qualifications or certifications for any of these categories. Requirements vary by jurisdiction across the Nation, from simple age and residency requirements to a medical degree with certification in forensic pathology by the American Board of Pathology. Individual state statutes determine the qualifications of individuals who may deliver death investigation services, which include death scene investigations, medical investigations, reviews of medical records, medicolegal autopsies, determination of the cause and manner of death, and completion of the certificate of death. Similarly, the actual classes of death over which these individuals may assume jurisdiction vary from state to state, though they generally include deaths that are sudden and unexpected, deaths that have no attending physician, and all suspicious and violent deaths.

In general, medicolegal death investigation personnel, however named, may conduct death scene investigations, perform autopsies, and determine the cause and manner of death when a person has died

as a result of violence, under suspicious circumstances, without a physician in attendance, or for other reasons.[13] Death investigators are trained personnel who investigate deaths reported to the medical examiner/coroner (ME/C) system; attend and investigate death scenes as a representative of the ME/C; have legal responsibility for the decedent; and conduct death investigations independent from those conducted by a law enforcement agency.[14] ME/C have a defined statutory authority to determine the cause and manner of death. While coroners are generally not medical doctors and in many cases are elected, medical examiners are almost always physicians and are appointed; some medical examiners are pathologists or forensic pathologists (licensed physicians who have undergone training in both general and forensic pathology and are certified by the American Board of Pathology). It is important to note that the distinction between coroner and medical examiner systems varies by jurisdiction. The qualifications, skills, and activities of death investigation personnel cannot necessarily be inferred from the title attached to the office.[15]

Approximately 2,342 ME/C offices are serving 3,343 counties in the United States.[16] Inconsistencies in the qualifications and responsibilities of ME/C among U.S. jurisdictions has been recognized as problematic for decades, and the question of whether the coroner system should be abolished in favor of a medical examiner system has been debated since a National Academy of Sciences Report in 1928 called for that change. While that issue remains controversial for a number of reasons, there is broad consensus among forensics experts that there is a need for increased assurance of competency for death investigation personnel, with certification generally proffered as an essential component of any strategy to achieve that assurance.

In the field of medicolegal death investigation, there are two recognized certifying bodies. The American Board of Medicolegal Death Investigators (ABMDI) offers two levels of certification[17] and is accredited by the Forensic Specialties Accreditation Board (FSAB). ABMDI certifies those personnel who conduct death investigations (medicolegal death investigators and coroners who do not conduct autopsies). The American Board of Pathology (ABP) offers certification in anatomic pathology, and a subspecialty certification in forensic pathology.[18] The ABP is a certifying body approved by the American Board of Medical Specialties. ABP certifies forensic pathologists who perform medicolegal autopsies.

As mentioned in Chapter 2, a significant shortcoming with regard to forensic science certification today is that no fully independent accrediting body (*i.e.,* one that exists outside the field of forensic science itself)

[13] Mathew J. Hickman, Kristen.A. Hughes, Kevin J. Strom, and Jeri D. Ropero-Miller, "ME/C' Offices, 2004*," Bureau of Justice Statistics Special Report*, June 2007, NCJ216756, U.S. Department of Justice, Office of Justice Programs, 2004, p. 1.
[14] Ernst. "The American Board of Medicolegal Death Investigators (ABMDI)." Presentation to the IWG. July 14, 2010.
[15] Mathew J. Hickman, Kristen.A. Hughes, Kevin J. Strom, and Jeri D. Ropero-Miller, "ME/C' Offices, 2004*," Bureau of Justice Statistics Special Report*, June 2007, NCJ216756, U.S. Department of Justice, Office of Justice Programs, 2004, p. 2.
[16] Mary Fran Ernst, "The American Board of Medicolegal Death Investigators (ABMDI)," presentation to the IWG, July, 14, 2010.
[17] See Appendix B.
[18] See Appendix C.

exists to assess and, as appropriate, give its imprimatur to worthy forensic science-related specialty boards that confer certification. This holds true for medicolegal death investigators.

The FSAB that accredits the ABMDI is a voluntary program to assess, recognize, and monitor specialty boards/certification bodies. The FSAB reviews and evaluates the operating procedures and standards of applicant or existing forensic certification bodies such as the ABMDI 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. But while FSAB standards are modeled on ISO/IEC 17024, its standards are not actually recognized by ISO/IEC 17011, which offers accreditation under ISO/IEC 17024, or by any other third party. (The American National Standards Institute, or ANSI, is the only accrediting body recognized by ISO/IEC 17011.) Thus the current approach to certification of medicolegal death investigators—with the exception of physicians certified by the American Board of Pathology—is lacking in terms of the level of independent evaluation of existing processes and programs.

Current Status

The ABDMI estimates that it has certified approximately 1,200 of the estimated 8,000 of medicolegal death investigators and coroners in the United States.[19] All told in the United States, less than 20 percent of medicolegal death investigators and coroners are board certified by either ABMDI or ABP. (Although there is no specific coroner certification, those coroners who are certified have obtained it through the ABMDI and/or ABP.) The National Association of Medical Examiners (NAME) has estimated that there are 400 to 500 full-time practicing forensic pathologists in the United States, and that 80 percent of them are board certified in forensic pathology. To fulfill the NAS report's 2009 recommendation for universal certification of death investigation professionals, some 6500 death investigators and coroners and 100 practicing forensic pathologists would need to obtain certification.

Challenges

An overarching challenge to achieving the NAS recommendations with regard to medicolegal death investigations is that there is no single recognized set of performance standards or best practices for ME/C systems, and, as noted by the NAS, there do not currently exist adequate incentives to create and promulgate such a set. Should a decision be made to move from a coroner system to a medical examiner system, significant Federal incentives would be needed to facilitate the change.

A number of other hurdles would need to be cleared in order to implement a nationally consistent system of death investigations, including: the need for some states to change state constitutions or codes that

[19] The BJS Report on ME/C Offices, 2004 estimated 7320 full time equivalent employees.

mandate the election of coroners (though some states have found that such provisions do not preclude the additional appointment of medical examiners); the need to earn political support from the constituent base underpinning local coroners; the need develop a "business model" that would make it practical to support more highly competent investigators in small localities (most coroner systems would not qualify for accreditation today because of problems related to size, insufficient staff and equipment, and insufficiently trained personnel); the need to overcome current unwillingness in many localities to develop cooperative regionalization for the provision of autopsy services; the need to train and employ more physicians—especially pathologists and forensic pathologists—in the death investigation offices; and the accompanying need to identify funding for infrastructure, staff, education, training, and equipment.

If a decision were made to implement a more uniform system of medicolegal death investigation across the United States, and if—as some have recommended—that goal were to be pursued in part through the development of a uniform state law developed in coordination with the Uniform Law Commission, the National Governors Association, and the National Conference of State Legislatures, among others, then mechanisms would be needed for providing the necessary allocation of funds by states to ensure compliance. While it would be the responsibility of each individual state to allocate funds and resources to comply with any such uniform state law, the Federal Government could provide funding coordinated through the National Institute of Justice to defray the initial costs associated with achieving certification for current personnel.

Another challenge relates to the need to provide continuing education and/or research opportunities to existing ME/C. Under current Federal policies, ME/C are effectively ineligible for direct Federal funding and cannot receive grants from the Department of Health and Human Services (including the National Institutes of Health [NIH]), the Department of Justice, or the Department of Homeland Security. The Paul Coverdell NFSIA is the only Federal grant program that names ME/Cs as eligible for grants. However, ME/C must compete for these grants against public safety officials and agencies, which have generally garnered higher grant support.

In addition to the above-mentioned challenges relating to certification of death examiners, there exist additional challenges relating to the accreditation of ME/C offices—a topic discussed in more depth in Chapter 1. As mentioned, accreditation attests that an office has a functional governing code; adequate staff, equipment, and training; and a suitable physical facility, and that it produces accurate, credible death investigation documentary products. But accreditation rates remain low among ME/C offices and forensic toxicology laboratories. Of the aforementioned 2,342 ME/C offices serving 3,343 counties in the United States, only 45 were accredited by the primary accreditor (the National Association of Medical Examiners) and 9 by the International Association of Coroners and Medical Examiners as of January 2011. The challenges to increasing these numbers are numerous; many medical examiner systems simply cannot meet NAME standards today due to constrained budgets, lack of staff, lack of equipment, and insufficient facilities. Moreover, the accreditation process carries administrative costs; accreditation requires periodic renewal; and, lacking incentives or enforcement mechanisms, many offices do not see any benefit to accreditation.

Finally, as with other NAS recommendations, implementation of a more uniform, medical-examiner-based system of medicolegal death investigations with certification and accreditation requirements will require cooperation and coordination among a wide array of stakeholders inside and outside government. Among the non-Federal organizations that the SoFS worked with to craft this report and would have stakes in any changes to current certification or accreditation requirements are: the American Board of Medicolegal Death Investigators (ABMDI), the National Association of Medical Examiners (NAME) and the International Association of Coroners and Medical Examiners (IACME), the Uniform Law Commission (ULC), and the National Conference of State Legislatures (NCSL).

Implementation

The implementation of the NAS's recommendations relating to medicolegal death investigators would require overcoming a number of hurdles. Congressional action may be required, but the continued development of certification programs need not wait for legislation and could be encouraged by administrative actions aimed at incentivizing progress towards this goal, including provision of grant funding for the development of curricula, training, and testing.

The total cost of achieving the proposed changes in the medicolegal death investigation system is very difficult to estimate. The table below depicts current approximate costs for trained personnel to obtain and maintain certification. The data in the table are based on information received by the SoFS from certifying bodies in 2011 and may be useful in efforts to begin to estimate the full costs of implementing a universal certification regimen.

Estimated costs (FY 2011) to obtain and maintain certification*		
	Death Investigator/Coroner	Forensic Pathologist
Examination Costs: application fee, examination fee, re-testing fee	$500/person	$3600[20]/person
Test preparation	$1000/person	$4000/person
Annual Continuing Education/Training	$500/person	$4000/person
Annual maintenance fees	$40/person	n/a
Recertification fees (every 10 years)	n/a	$1800/person

*This funding does not include salaries, benefits or other costs associated with basic training, fellowships and staffing.

[20] Costs include both Anatomic (AP) and Forensic (FP) Pathology boards.

4. Proficiency Testing of Forensic Examiners

The 2009 NAS report encouraged the development and implementation of improved feedback mechanisms to help identify shortcomings in forensic science practices, and highlighted proficiency tests—designed to emulate a "realistic, representative cross-section of casework"—as essential feedback mechanisms for forensic science service providers. The report called for the development of new tools for advancing proficiency testing in forensic science and recommended that proficiency testing be a mandatory element of practitioner certification.

Background

In the context of forensic science, a proficiency test is a discipline-specific analytical test used to evaluate the technical competence of examiners and support personnel, and/or the overall performance of a forensic science service provider. Proficiency tests can help ensure that individual and laboratory-wide procedures are effective and reliable on an ongoing basis. They do not, however, provide a systematic estimate of laboratory error rates, in part because relevant samples are typically free of the contaminants that often accompany actual samples, thus possibly underestimating error rates, and because proficiency tests are administered to a full range of practitioners, including trainees and others who would not typically have responsibility for such samples from the field, thus possibly overestimating error rates.

The benefits of discipline-specific proficiency testing include:

- Demonstration of a laboratory's ability to satisfy, on an ongoing basis, accreditation or certification requirements and ongoing competency;
- Comparison of an individual's or a laboratory's performance with that of another;
- Identification of methodological problems, transcription error patterns, or other undetected performance weaknesses and initiation of actions for improvement;
- Establishment of the effectiveness and comparability of test or measurement methods and, through the provision of metrics that could be analyzed, interpreted, and published, facilitation of further standardization of laboratory procedures and best practices;
- Validation of uncertainty claims;
- Enhancement of stakeholder confidence in the reliability of forensic science providers' work products.

In its most comprehensive form, forensic science proficiency testing involves three distinct entities: forensic science service providers,[21] proficiency test providers, and bodies that accredit the test providers.[22] Proficiency test providers use a variety of testing mechanisms, including open or declared (in which participants know they are being tested); blind (in which participants do not know they are being tested); and re-examination testing (in which an examiner's completed prior casework is randomly

[21] The term "forensic science service provider" is used interchangeably with forensic science laboratory
[22] See Appendix C for a graphical depiction of the components of the proficiency testing ecosystem

selected for reanalysis). (The relative cost-effectiveness of these and other approaches remains a matter of debate within the forensics community, with some researchers concluding that internal quality assurance methods such as random reanalysis may be more cost effective than external blind proficiency testing.)[23]

In some cases, forensic science service providers turn to forensic science accrediting organizations for proficiency testing services. In other cases they contract with organizations that specialize in proficiency testing. In still other cases, forensic science service providers conduct their own ("internal") proficiency testing or assess proficiency not through formal testing at all but rather through observation, case presentation, or peer review.

Just as forensic science service providers are held to certain international standards for purposes of accreditation and proficiency testing, forensic proficiency test providers can seek accreditation to indicate proficiency in their endeavors. This is achieved when the test providers demonstrate compliance to ISO/IEC 17043 standards[24] as certified by independent, third-party accreditation bodies[25] (different from the accrediting bodies that accredit forensic science service providers). These accrediting bodies consider such elements as the design and operation of testing schemes used by the test providers, data analysis and evaluation of results, communication with participants, and reporting confidentiality. To date however, most proficiency test providers have either not sought or not achieved full accreditation at the ISO/IEC 17043 level. As an alternative, a number of proficiency test providers have achieved "recognition" by accrediting bodies—a non-standardized achievement.

Appendix 4B illustrates the range of standards to which proficiency test providers are held by various accrediting/oversight bodies, including variability in the stringency of test requirements and the use of review committees to assess test results.

Current Status

No national requirement exists today demanding that forensic science service providers participate in proficiency testing, but many do to varying degrees. Some 274 of 351 publicly funded laboratories that responded to a 2002 Bureau of Justice Statistics census[26] reported they were engaged in at least some kind of proficiency testing, with testing slightly less common among smaller laboratories and those serving municipal jurisdictions. Among the laboratories engaged in proficiency testing, almost all reported using open or declared tests; slightly more than half of those that submitted to proficiency testing reported the

[23] The feasibility of external blind DNA proficiency testing. II. Experience with actual blind tests, J Forensic Sci. 2003 Jan;48(1):32-40.
[24] ISO/IEC 17043:2010, Conformity assessment – General requirements for proficiency testing.
[25] For a list of accrediting bodies, see Appendix B
[26] *Census of Publicly Funded*. *Forensic Crime Laboratories*, *2002*. February 2005, NCJ 207205: http://www.bjs.gov/content/pub/pdf/cpffcl02.pdf

use of random case reanalysis; and about one-quarter of those engaged in testing reported using at least some blind tests. Virtually all laboratories engaged in proficiency testing said they used tests that were generated externally—an approach that makes possible comparative analyses among laboratories. In addition, about three-quarters of laboratories engaged in proficiency testing reported some use of internally generated tests.

As of 2010, SoFS was aware of 14 proficiency test providers (see Appendix 4B) and six accrediting bodies. At that time, none of the proficiency test providers were accredited to the ISO/IEC 17043 standards[27]. In November 2013, however, ASCLD/LAB reported its recent accreditation of seven proficiency test providers to the ISO/IEC 17043 standards.[28]

Challenges

Proficiency testing programs come with a cost (see Tables 2 and 3), and any requirement that demands a minimum schedule of proficiency testing will create new budget pressures on laboratories. That cost challenge could be mitigated over time as a national requirement for proficiency testing (for example, making testing a prerequisite for accreditation or certification) would increase demand for test providers, create opportunities for new test providers, and ultimately increase competition and foster cost savings for participants.

A related challenge is that funding spent on proficiency testing would be unavailable for other purposes, including test innovation by forensic science service providers. Mitigating this risk, however, is that uniform proficiency test standards would allow for more effective inter-laboratory comparisons, which—in conjunction with additional information on procedures, protocols, instrument methods, and settings—could ultimately speed the development of useful technological innovations.

Finally, if proficiency test providers determine that costs of accreditation are prohibitive for particular forensic disciplines (*e.g.,* ones with relatively few practitioners), those test providers may choose to discontinue testing services in those categories of testing. The discontinuance of discipline-specific proficiency tests by test providers could put pressure on forensic science service providers to conduct internal rather than external proficiency tests. The establishment of internal proficiency tests requires training and authorization of forensic science practitioners. Ideally these practitioners would be trained at a level that allows them to participate as subject matter experts in the independent test reviews conducted by the accrediting bodies.[29] If forensic science service providers determine that proficiency

[27] The American Association for Laboratory Accreditation (A2LA) also reported the accreditation of proficiency test provider NAPT to ISO/IEC 17043 standards in October 2010.

[28] Cellmark Forensics (IQAS Proficiency Tests), Collaborative Testing Services, Inc. (CTS), College of American Pathologists (CAP), Competency Assessment Services Ltd (CAS), Forensic Testing Services (FTS), International Society of Forensic Computer Examiners (ISFCE), Serological Research Institute (SERI).

testing is too expensive or too time-consuming to conduct internally for certain disciplines, they may also choose to discontinue services in those disciplines.

Implementation

As with other professional standards the SoFS considered options for more widespread adoption by forensic science service providers and examiners and there are effectively three possible approaches to implementing the NAS recommendation on proficiency testing.

One approach is to work with Congress to pass legislation requiring a broad but well-defined set of forensic science service providers (such as "all entities that provide forensic science services in disciplines and categories of testing recognized by forensic science accrediting bodies") that would be subject to proficiency test requirements within a certain time frame, perhaps as a condition of accreditation.

A second approach is to work with a broad array of stakeholders—including the Uniform Law Commission, National Governors Association, National Committee of State Legislators, and the forensic science community—to craft a uniform law that mandates compliance with an agreed-upon schedule or program of proficiency testing, with the goal of getting states to adopt this law across the Nation.

A third approach is for the Department of Justice to mandate proficiency testing for all laboratories under its direct control and, for laboratories over which direct control is absent, mandate proficiency testing as a prerequisite for certain financial and other benefits (such as training opportunities or Federal funding) that normally are awarded to providers from the Department.

A fourth approach is to utilize portions of some or all of the first three approaches in a well-integrated fashion and Federal, state and local collaboration. This hybrid approach might afford the opportunity to span the entire national forensic science community in case there would be coverage gaps in any of the individual approaches described above.

Each of these approaches has its own constellation of costs and benefits, which deserve careful study, but all would ultimately have to address the need for funding in support of proficiency testing (including program administration, technical assistance, and education and training) as well as the need to define requirements relating to accreditation of forensic test providers.

5. A National Code of Ethics for Forensic Service Providers

The 2009 NAS report calls for a "National Code of Ethics and Professional Responsibility for all forensic science disciplines and encourage(s) individual societies to incorporate this national code as part of their professional code of ethics." The report further calls for an exploration of potential enforcement mechanisms for addressing serious ethical violations.

One approach to achieving this goal, in synchrony with the NAS goals of requiring accreditation and certification of forensics laboratories and service providers, would be for all accreditation and certifying organizations to adopt an agreed-upon National Code of Ethics as part of their requirements for accreditation and certification, and all Federal forensic laboratories[30] to incorporate the National Code into their quality assurance programs and internal performance measures. Widespread adoption of a National Code of Ethics could also precede the promulgation of a national requirement for accreditation and certification through any of several administrative forcing mechanisms—for example, by making such adoption a prerequisite for receipt of Coverdell Forensic Science Improvement Grants or research funds from the National Institute of Justice.

The SoFS identified and studied more than 45 codes of ethics in use by various forensic science organizations. Many of these codes apply to specific forensic science disciplines, and no single code of ethics has been adopted or implemented on a national scale that covers all forensic disciplines. SoFS's review of existing codes identified four major categories of ethical assurance typically addressed by such codes: 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 SoFS review found one code of ethics that addresses all four of the above assurances and has broad applicability to all forensic science disciplines: the "ASCLD/LAB Guiding Principles of Professional Responsibility for Crime Laboratory and Forensic Scientists" code found in the ASCLD/LAB *International* Supplemental.[31] While acknowledging that, over time, adaptations or improvements to that code might be identified, the SoFS consensus opinion was that the ASCLD/LAB code or one very much like it would serve well as an inaugural National Code of Ethics for forensic science providers and practitioners. The SoFS also concluded that by incorporating this or any National Code into accreditation requirements and within individual Federal laboratories' quality assurance programs and internal performance measures, the Code would have a measure of enforceability.

[30] For purposes of this recommendation, the SoFS defined "forensic laboratory" as having at least one full-time analyst who examines physical evidence in criminal and/or investigative matters and provides reports and/or opinion testimony with respect to such evidence in United States courts of law.

[31] ASCLD/LAB Guiding Principles of Professional Responsibility for Crime Laboratories and Forensic Scientists. Available at: http://www.ascld-lab.org/guiding-principles/

The SoFS also determined that the impact of such a requirement would likely be minimal since the requirements outlined in the ASCLD/LAB code are already incorporated in the most widely used standards for accreditation: those used by ISO/IEC 17025 and by ASCLD/LAB. Unaccredited forensic science service providers could achieve compliance by management, independent of accreditation.

APPENDICES

APPENDIX 1A: ESTIMATING COSTS OF ACCREDITATION

The total cost of achieving universal accreditation of forensic science service providers (FSSPs) is very difficult to estimate given large uncertainties regarding the number, type, and organizational structures of the Nation's forensic laboratories and related entities; the services they provided; and the number of practitioners that would be affected in various ways.

The table below depicts estimated costs of achieving and maintaining accreditation for one forensic science service provider (as of 2011), based on information gathered by SoFS from accrediting bodies and other sources.

TABLE 1 - Estimated costs (FY 2011) to achieve and maintain accreditation[1]

	Small FSSP	**Medium FSSP**	**Large FSSP**
Accrediting Body Cost Application Fee, pre-consultation, initial inspection, yearly fee, yearly surveillance visit	$1500/analyst/year	$1000/analyst/year	$500/analyst/year
Proficiency Testing	$1000/analyst/year	$1000/analyst/year	$1000/analyst/year
Continuing Education/Training	$2000/analyst/year	$2000/analyst/year	$2000/analyst/year
QA Staffing	$120,000/year	$120,000/year	$240,000/year
Equipment Calibration – Initial	$15,000	$20,000	$25,000
Equipment Calibration - Yearly maintenance	$5,000	$10,000	$15,000
Variables			
Practitioners	≤5	6-15	>15
Disciplines	1-2	3-6	7+
Sites	1	1	1+

[1]Funding requirements are dependent upon variables such as number of analysts, number and type of forensic services, number of sites, organizational structure and agency specific requirements, along with other factors.

TABLE 2 - Estimated costs [1](FY 2011) for Medical Examiner/Coroner offices to achieve and maintain accreditation.

	NAME	**IACME**	**ABFT**
Accrediting Body Cost[2] Application fee, pre-consultation, initial inspection	$2500/office/system	$2500/office	$4000/laboratory
Annual Maintenance Fee	$1000/office/system	$1000/office/system	$3500/laboratory
Proficiency Testing	n/a	n/a	$1000/practitioner/year
Continuing Education/Training	$1000/practitioner/year	$1000/practitioner/year	$2000/practitioner/year
QA Staffing	$120,000/year	$120,000/year	$120,000/year[3]
Equipment Calibration – Initial	$5000	$5000	$20,000
Equipment Calibration – Yearly maintenance	$5000	$5000	$10,000

[1]Funding requirements are dependent upon variables such as number of analysts, number and type of forensic services, number of sites, organizational structure and agency specific requirements, along with other factors; SoFS anticipates that these costs will rise in the future and could become comparable to the costs listed in Table 1. Also note that these are not ISO-based systems and additional challenges and costs could be incurred if, as some in the forensic science community have recommended, accreditation programs currently accepted within the professional communities for medical examiners, coroners and forensic toxicology laboratories, become recognized as ISO/IEC 17011 accrediting bodies in the field of

forensic science by the Inter American Accreditation Cooperation (IAAC) and/or the International Laboratory Accreditation Cooperation (ILAC).

[2]Cost varies according to size of office.

[3]Represents a laboratory with 6-15 practitioners at one site.

APPENDIX 1B: FEDERAL FORENSIC PROVIDERS AND THEIR ACCREDITATION STATUS[32]

	Federal Forensic Service Providers	Accredited
1	California – Bureau of Alcohol, Tobacco and Firearms (ATF) San Francisco	X
2	California – U.S. Drug Enforcement Administration (DEA) Southwest	X
3	California – DEA Western	X
4	California – U.S. Customs and Border Protection Los Angeles	*
5	California – U.S. Customs and Border Protection San Francisco	*
6	Colorado - EPA National Enforcement Investigations Center	X
7	DC – U.S. Customs and Border Protection	*
8	DC - Department of Veterans Affairs, Office of Inspector General	
9	DC – U.S. Secret Service	X
10	DC – U.S. Department of Justice (DOJ) Digital Evidence	
11	Delaware – DoD Armed Forces Medical Examiner System (includes Armed Forces DNA Identification Laboratory and DoD Forensic Toxicology Laboratory	X
12	Florida – DEA Southeast	X
13	Georgia – ATF	X
14	Georgia – EPA, Region 4, Science and Ecosystem Support Division	X
15	George – U.S. Army Criminal Investigation	X

[32] These data were the best available to SoFS as of 2011. Accreditation status marked with an asterisk (*) indicates accreditation that has been obtained since 2011. In addition to the providers listed here, there are 16 Regional Computer Forensic Labs that work through agency partnerships established by FBI Federal agencies that use and supply personnel and equipment. For more details, please visit: www.rcfl.gov.

16	Georgia – U.S. Customs and Border Protection Savannah	*
17	Hawaii - Joint POW/MIA Accounting Command, Central Identification Laboratory	X
18	Illinois - DEA North Central	X
19	Illinois – Internal Revenue Service (IRS)	
20	Illinois – U.S. Customs and Border Protection Chicago	*
21	Maryland - ATF	X
22	Maryland - DEA MidAtlantic	X
23	Maryland – DoD Computer Forensics Lab	X
24	Maryland – National Bioforensics Analysis Center	X
25	Maryland - Treasury Inspector General for Tax Administration	In process
26	Nebraska – DoD Joint POW/MIA Accounting Command – Satellite Central Identification Laboratory	*
27	South Carolina – NOAA Center for Coastal Environmental Health and Biomolecular Research, Charleston, SC	
28	New Jersey – U.S. Customs and Border Protection New York	*
29	New York - DEA Northeast	X
30	Ohio – U.S. Food and Drug Administration (FDA) Regional Lab	
31	Oregon – U.S. Fish and Wildlife Service Laboratory	X
32	South Carolina - IRS	
33	Texas – DEA South Central	X
34	Virginia - DEA Special Testing and Research	X
35	Virginia - DEA Digital Evidence	X
36	Virginia – U.S. Immigration and Customs Enforcement (ICE)	X
37	Virginia - FBI	X

38	Virginia – FBI Computer Analysis Response Team (50 divisions)	
39	Virginia – U.S. Customs and Border Protection Springfield	*
40	Virginia – U.S. Postal Inspection Service - Digital Evidence Units (18)	
41	Virginia – U.S. Postal Inspection Service	X

APPENDIX 1C: PUBLICLY FUNDED FORENSIC CRIME LABORATORIES OPERATING IN THE UNITED STATES AS OF 2005[33]

Alabama DFS - Birmingham

Alabama DFS - Dothan

Alabama DFS - Florence

Alabama DFS - Headquarters

Alabama DFS - Huntsville

Alabama DFS - Jacksonville

Alabama DFS - Mobile

Alabama DFS - Montgomery

Alabama DFS - Tuscaloosa

Alaska DPS

Arizona - Chandler PD

Arizona - Mesa PD

Arizona - Phoenix PD

Arizona - Scottsdale PD

Arizona - Tucson PD

Arizona DPS - Central

Arizona DPS - Northern

Arizona DPS - Southern

Arizona DPS - Western

Arkansas - Hope Regional

[33] Bureau of Justice Statistics report (July 2008)

Arkansas State Crime Laboratory

California - Alameda County Sheriff

California - ATF San Francisco

California - Contra Costa County Sheriff

California - County of Los Angeles, Department of Coroner

California - DEA Southwest

California - DEA Western

California - El Cajon City PD

California - Fresno County Sheriff

California - Huntington Beach Police Department

California - Kern County DA

California - Long Beach PD

California - Los Angeles County Sheriff

California - Los Angeles PD

California - Oakland PD

California - Orange County Sheriff Coroner

California - Sacramento County DA

California - San Bernardino County Sheriff

California - San Diego PD

California - San Diego Sheriff

California - San Francisco PD

California - San Mateo County Sheriff

California - Santa Ana PD

California - Santa Clara County DA

California – U.S. CBP Los Angeles

California – U.S. CBP San Francisco

California - Ventura County Sheriff

California DOJ - Cal DNA Data Bank Richmond

California DOJ - Central Valley

California DOJ - Chico

California DOJ - DNA Casework, Richmond

California DOJ - Eureka

California DOJ - Freedom

California DOJ - Fresno

California DOJ - Missing Persons DNA Program, Richmond

California DOJ - Redding

California DOJ - Riverside

California DOJ - Sacramento Criminalistics

California DOJ - Sacramento Latent Prints and BAC

California DOJ - Sacramento Toxicology

California DOJ - Santa Barbara

California DOJ - Santa Rosa

Colorado - Aurora PD

Colorado - Colorado Springs PD

Colorado - Denver PD

Colorado - Grand Junction PD

Colorado - Greeley/Weld County

Colorado - Jefferson County Sheriff

Colorado - Lakewood PD

Colorado BI - Denver

Colorado BI - Montrose

Colorado BI - Pueblo

Connecticut - Waterbury Police Department

Connecticut DPS - Hartford

Connecticut DPS - Meriden

DC – U.S. CBP

DC - Department of Veterans Affairs, Office of Inspector General

DC – U.S. Secret Service

Delaware - Chief ME Wilmington

Delaware – DoD Armed Forces Medical Examiner System

Delaware State Police

Florida - Broward County Sheriff

Florida - DEA Southeast

Florida - Indian River Regional

Florida - Manatee County Sheriff's Office

Florida - Miami Dade PD

Florida - Palm Beach County Sheriff

Florida - Pinellas County

Florida - Sarasota County Sheriff

Florida - State Fire Marshall

Florida DLE - Ft. Meyers

Florida DLE - Jacksonville

Florida DLE - Orlando

Florida DLE - Pensacola

Florida DLE - Tallahassee

Florida DLE - Tampa

Georgia - ATF

Georgia – U.S. Army Criminal Investigation

Georgia – U.S. CBP Savannah

Georgia BI-DOFS - Central

Georgia BI-DOFS - Coastal

Georgia BI-DOFS - Eastern

Georgia BI-DOFS - Headquarters Atlanta

Georgia BI-DOFS - Northeastern

Georgia BI-DOFS - Northwestern

Georgia BI-DOFS - Southwestern

Georgia BI-DOFS - Western

Hawaii - Hawaii County PD

Hawaii - Honolulu PD

Hawaii – DoD Joint POW/MIA Accounting Command – Central Identification Laboratory

Idaho State Police - Coeur D'Alene

Idaho State Police - Meridian

Idaho State Police - Pocatello

Illinois - Cook County Sheriff

Illinois - DEA North Central

Illinois – Du Page County Sheriff

Illinois - IRS

Illinois - Northeastern Illinois Regional

Illinois – U.S. CBP Chicago

Illinois – U.S. Postal Inspection Service

Illinois State Police - Rockford

Illinois State Police - Chicago

Illinois State Police - Joliet

Illinois State Police - Metro East

Illinois State Police - Morton

Illinois State Police - Research and Development

Illinois State Police - Southern Illinois Forensic Center

Illinois State Police - Springfield

Illinois State Police - Westchester

Indiana - Anderson PD

Indiana - Greenwood PD

Indiana - Indianapolis-Marion County

Indiana State Police - Evansville

Indiana State Police - Fort Wayne

Indiana State Police - Indianapolis

Indiana State Police - Lowell

Iowa Division of Criminal Investigation

Kansas - Johnson County Sheriff

Kansas - Regional Forensic Science Center

Kansas BI - Great Bend

Kansas BI - Kansas City

Kansas BI - Pittsburg

Kansas BI - Topeka

Kentucky State Police - Central

Kentucky State Police - Eastern

Kentucky State Police - Jefferson

Kentucky State Police - Northern

Kentucky State Police - Southeastern

Kentucky State Police - Western

Louisiana - Acadiana Criminalistics

Louisiana - Jefferson Parish Crime Laboratory

Louisiana - Jefferson Parish Forensic Center

Louisiana - New Orleans Police Department

Louisiana - North Louisiana Criminalistics, Alexandria

Louisiana - North Louisiana Criminalistics, Shreveport

Louisiana - North Louisiana Criminalistics, West Monroe

Louisiana - Southwest Louisiana Crime Laboratory

Louisiana DPS/State Police

Maine - Health and Environmental Testing

Maine State Police

Maryland - Anne Arundel County PD

Maryland - ATF

Maryland - Baltimore City PD

Maryland - Baltimore County PD

Maryland - DEA MidAtlantic

Maryland – DoD Computer Forensic Laboratory

Maryland - Hagerstown City PD

Maryland - Montgomery County PD

Maryland - Ocean City Police Department

Maryland - Prince George's County Police

Maryland - Treasury Inspector General for Tax Administration

Maryland State Police - Berlin

Maryland State Police - Hagerstown

Maryland State Police - Pikesville

Massachusetts - Boston PD

Massachusetts - University of MA Medical Center, BioTech/Tox Laboratory

Massachusetts - University of MA Medical Center, Drug Laboratory

Massachusetts Department of Health - Drug Laboratory

Massachusetts Department of Health - University Food and Drug Laboratory

Massachusetts State Police - Agawam

Massachusetts State Police - Danvers

Massachusetts State Police - Sudbury

Michigan - Battle Creek PD

Michigan - Detroit PD

Michigan - Oakland County Sheriff

Michigan State Police - Bridgeport

Michigan State Police - Grand Rapids

Michigan State Police - Grayling

Michigan State Police - Lansing

Michigan State Police - Marquette

Michigan State Police - Northville

Michigan State Police - Sterling Heights

Minnesota - Hennepin County Sheriff

Minnesota - Minneapolis PD

Minnesota - St. Paul PD

Minnesota BCA - Bemidji

Minnesota BCA - St. Paul

Mississippi - Jackson Police Department

Mississippi - Tupelo PD

Mississippi DPS - Batesville

Mississippi DPS - Gulf Coast

Mississippi DPS - Jackson

Mississippi DPS - Meridian

Missouri - Independence PD

Missouri - Kansas City Police

Missouri - MSSU Regional Crime Laboratory

Missouri - Northeast Area Criminalistics

Missouri - SEMO Regional

Missouri - St Louis County Crime Laboratory

Missouri - St. Charles County Sheriff

Missouri - St. Louis Metro Police

Missouri State Highway Patrol - Headquarters

Missouri State Highway Patrol - Troop B

Missouri State Highway Patrol - Troop C

Missouri State Highway Patrol - Troop D

Missouri State Highway Patrol - Troop G

Missouri State Highway Patrol - Troop H

Montana DOJ

Nebraska – DoD Joint POW/MIA Accounting Command – Satellite Central Identification Laboratory

Nebraska - Douglas County Sheriff

Nebraska State Patrol - Lincoln

Nebraska State Patrol - North Platte

Nevada - Henderson PD

Nevada - Las Vegas Metropolitan PD

Nevada - Washoe County Sheriff

New Hampshire State Police

New Jersey - Burlington County

New Jersey - Cape May County Prosecutor

New Jersey - Hudson County Prosecutor

New Jersey - Newark PD

New Jersey - Ocean County Sheriff

New Jersey - Union County Prosecutor

New Jersey – U.S. CBP New York

New Jersey State Police - Central

New Jersey State Police - DNA Laboratory

New Jersey State Police - East

New Jersey State Police - North

New Jersey State Police - South

New Mexico - Albuquerque PD

New Mexico - Department of Health, Toxicology

New Mexico DPS - Northern

New Mexico DPS - Southern Lab

New York - Chief ME, Department of Forensic Biology

New York - DEA Northeast

New York - Erie County

New York - Monroe County

New York - Nassau County ME Genetics

New York - Nassau County ME Toxicology

New York - Nassau County PD

New York - New York City PD

New York - Niagara County Sheriff

New York - Onondaga County

New York - Suffolk County

New York – U.S. Postal Inspection Service

New York - Westchester County

New York - Westchester County DPS

New York - Yonkers PD

New York State Police - Forensic Investigation Center

New York State Police - Mid-Hudson

New York State Police - Southern Tier

New York State Police - Western

North Carolina - Charlotte Mecklenburg PD

North Carolina State BI - Raleigh

North Carolina State BI - Western

North Dakota - Office of Attorney General, Bismarck

Ohio - Canton Stark County

Ohio - Cleveland PD

Ohio - Columbus Division Of Police

Ohio - Columbus Investigative Unit

Ohio - Cuyahoga County Coroner

Ohio - Hamilton County Coroner's Office

Ohio - Lake County

Ohio - Mansfield PD

Ohio - Miami Valley Regional

Ohio - Newark PD

Ohio - Springfield PD

Ohio - Toledo PD

Ohio – U.S. FDA Regional Lab

Ohio BCI - Central

Ohio BCI - Northeast

Ohio BCI - Northwest

Ohio DPS - Columbus

Ohio State Fire Marshall

Oklahoma - Ardmore PD

Oklahoma - Broken Arrow PD

Oklahoma - OK City PD

Oklahoma - Oklahoma County DA

Oklahoma - Tulsa Police Department

Oklahoma BI - East

Oklahoma BI - Northeast

Oklahoma BI - Northwest

Oklahoma BI - OK City, Central

Oklahoma BI - Southwest

Oklahoma State BI - Central Latent Evidence

Oregon - National Fish and Wildlife

Oregon State Police - Bend

Oregon State Police - Central Point

Oregon State Police - Ontario

Oregon State Police - Pendleton

Oregon State Police - Portland Metro

Oregon State Police - Springfield

Pennsylvania - Allegheny County ME

Pennsylvania - Bucks County

Pennsylvania - Philadelphia PD

Pennsylvania State Police - Bethlehem

Pennsylvania State Police - DNA

Pennsylvania State Police - Erie

Pennsylvania State Police - Greensburg

Pennsylvania State Police - Harrisburg

Pennsylvania State Police - Lima

Pennsylvania State Police - Wyoming

Rhode Island Department of Health

Rhode Island State Laboratory

South Carolina - Aiken County Sheriff

South Carolina - Anderson Oconee Regional

South Carolina - Beaufort County Sheriff

South Carolina - Charleston PD

South Carolina - Columbia PD

South Carolina - Greenville DPS

South Carolina - Horry County PD

South Carolina - Lexington County Sheriff

South Carolina - Orangeburg DPS

South Carolina - Richland County Sheriff

South Carolina - SLED

South Carolina - Spartanburg County Sheriff

South Carolina - York County Sheriff

South Dakota - Attorney General Division of Crime Investigation

South Dakota - Rapid City PD

South Dakota - Sioux Falls PD

South Dakota - State Health Lab

Tennessee - Rutherford County Sheriff

Tennessee – U.S. Postal Inspection Service

Tennessee BI - Knoxville

Tennessee BI - Memphis

Tennessee BI - Nashville

Texas - Austin PD

Texas - Bexar County

Texas - Brazoria County Sheriff

Texas - DEA South Central

Texas - El Paso PD

Texas - Fort Worth PD

Texas - Harris County ME

Texas - Houston PD

Texas - Jefferson County Sheriff

Texas - Pasadena PD

Texas - Southwestern Institute of Forensic Sciences

Texas - Tarrant County ME

Texas - UNT Health Science Center

Texas DPS - Abilene

Texas DPS - Amarillo

Texas DPS - Austin

Texas DPS - Corpus Christi

Texas DPS - El Paso

Texas DPS - Garland

Texas DPS - Houston

Texas DPS - Laredo

Texas DPS - Lubbock

Texas DPS - McAllen

Texas DPS - Midland

Texas DPS - Tyler

Texas DPS - Waco

Texas State Fire Marshall

Utah - Public Health, Toxicology

Utah DPS - Central

Utah DPS - Eastern

Utah DPS - Northern

Utah DPS - Southern

Vermont Laboratory

Virginia - DEA Special Testing and Research

Virginia – U.S. Immigration and Customs Enforcement

Virginia - FBI

Virginia – U.S. CBP Springfield

Virginia – U.S. Postal Inspection Service

Virginia DFS - Central

Virginia DFS - Eastern

Virginia DFS - Northern

Virginia DFS - Western

Washington State Patrol - Kennewick

Washington State Patrol - Latent Prints Lab

Washington State Patrol - Marysville

Washington State Patrol - Seattle

Washington State Patrol - Spokane

Washington State Patrol - Tacoma

Washington State Patrol - Vancouver

West Virginia - Marshall University Lab

West Virginia State Police

Wisconsin - Kenosha County Division of Health

Wisconsin State - Madison

Wisconsin State - Milwaukee

Wisconsin State - Wausau

Wyoming - State Crime Lab

APPENDIX 1D: SOFS TALLY OF PUBLICLY FUNDED PROVIDERS LISTED IN APPENDIX C THAT WERE NOT ACCREDITED BY EITHER THE AMERICAN SOCIETY OF CRIME LABORATORY DIRECTORS / LABORATORY ACCREDITATION BOARD (ASCLD-LAB) OR FORENSIC QUALITY SERVICES, INC. (FQS) AS OF 2009*

1. Alabama – DFS – Headquarters
2. Arizona- Chandler PD
3. California – Huntington Beach PD
4. California – U.S. Customs and Border Protection, Los Angeles*
5. California – U.S. Customs and Border Protection, San Francisco*
6. Colorado – Aurora PD
7. Colorado – Grand Junction PD
8. Colorado – Lakewood PD
9. Colorado – Bureau of Investigation – Montrose
10. Connecticut – Waterbury PD
11. DC – Customs and Border Protection*
12. DC – Dept. of Veteran Affairs, OIG
13. Delaware State Police
14. Florida – Manatee County Sheriff's Office
15. Florida – Sarasota County Sheriff
16. Florida – State Fire Marshall
17. Georgia – U. S. Customs and Border Protection, Savannah*
18. Hawaii – Hawaii County PD
19. Hawaii – U.S. Army Criminal Investigation Laboratory
20. Illinois – Cook County Sheriff
21. Illinois – IRS
22. Illinois – U.S. Customs and Border Protection, Chicago*
23. Illinois – U.S. Postal Inspection Service
24. Indiana – Anderson PD
25. Indiana – Greenwood PD

26. Kentucky – State Police – Eastern
27. Kentucky – State Police – Southeastern
28. Kentucky – State Police – Western
29. Louisiana – Jefferson Parish Forensic Center
30. Louisiana – New Orleans PD
31. Maryland – Hagerstown PD
32. Maryland - Ocean City PD
33. Maryland – Treasury Inspector General for Tax Administration
34. Massachusetts – University of MA Medical Center, BioTech/Tox Lab
35. Massachusetts – Dept. of Health – Drug Laboratory
36. Massachusetts – Dept. of Health – University Food and Drug Lab
37. Massachusetts – State Police – Agawam
38. Michigan – Battle Creek PD
39. Michigan – Detroit PD
40. Michigan – Oakland County Sheriff
41. Minnesota – Minneapolis PD
42. Minnesota – St. Paul PD
43. Mississippi – Jackson PD
44. Mississippi – Tupelo PD
45. Missouri – Independence PD
46. Missouri – MSSU Regional Crime Laboratory
47. Missouri – Northeast Area Criminalistics
48. Missouri – SEMO Regional
49. Nebraska – Douglas County Sheriff
50. Nebraska – State Patrol – North Platte
51. Nevada – Henderson PD
52. New Jersey – Burlington County
53. New Jersey – Hudson County Prosecutor
54. New Jersey – Newark PD
55. New Jersey – Ocean County Sheriff
56. New Jersey – U.S. Customs and Border Protection, NY*
57. New Mexico – Dept. of Health, Toxicology
58. New York – U.S. Postal Inspection Service
59. Ohio – Cleveland PD
60. Ohio – Columbus Investigative Unit
61. Ohio – Newark PD
62. Ohio – Springfield PD
63. Ohio – Toledo PD
64. Oklahoma – Bureau of Investigation, Central, Oklahoma City
65. Oklahoma – Bureau of Investigation, Central Latent Evidence
66. Pennsylvania – Bucks County
67. Pennsylvania – State Police DNA
68. South Carolina – Aiken County Sheriff
69. South Carolina – Anderson Oconee Regional
70. South Carolina – Beaufort County Sheriff
71. South Carolina – Columbia PD

72. South Carolina – Greenville DPS
73. South Carolina – Horry County PD
74. South Carolina – Lexington County Sheriff
75. South Carolina – Orangeburg PDS
76. South Carolina – Spartanburg County Sheriff
77. South Carolina – York County Sheriff
78. South Dakota – Rapid City PD
79. South Dakota – Sioux Falls PD
80. South Dakota – State Health Lab
81. Texas – Southwestern Institute of Forensic Sciences
82. Texas – UNT Health Science Center
83. Utah – Public Health, Toxicology
84. Utah – DPS – Eastern
85. Virginia – U.S. Customs and Border Protection, Springfield*
86. Virginia – U.S. Postal Inspection Service

Note: Publicly funded providers marked with an asterisk (*) are those that are known to have obtained accreditation since 2009.

APPENDIX 1E: ADDITIONAL FORENSICS SERVICE PROVIDERS NOT INCLUDED IN THE BJS 2005 SURVEY/APPENDIX C THAT WERE ACCREDITED AS OF 2009:

(Note: Labs accredited by ASCLD/LAB are in regular font; those *accredited by Forensic Quality Services and not ASCLD/LAB are in italics)*

1.	Alabama	Department of Forensic Sciences, Auburn Laboratory, Auburn
2.	*Arizona*	*Chromosomal Laboratories, Phoenix*
3.	California	Human Identification Technologies, Inc., Redlands
4.	California	San Diego Regional Computer Forensics Lab
5.	California	Serological Research Institute, Forensic Serological Analysis, Richmond
6.	California	Silicon Valley Regional Computer Forensic Lab, Menlo Park
7.	California	Ventura County Sheriff's Department Forensic Sciences Lab – Breath Alcohol Calibration Program, Ventura.
8.	*California*	*Forensic Analytical Sciences, Haywood*
9.	Colorado	Bureau of Investigation Western Slope Regional Forensic Lab, Grand Junction
10.	Colorado	Rocky Mountain Regional Computer Forensic Lab, Centennial
11.	*Colorado*	*EPA National Enforcement Investigations Center, Denver*
12.	Florida	Bernhardt Labs, Florida Forensics, LLC., Jacksonville
13.	Florida	Dept. of Law Enforcement, Daytona Beach Regional Crime Lab
14.	*Florida*	*DNA Labs International, Deerfield*
15.	*Florida*	*Florida Racing Laboratory, Gainesville*
16.	*Florida*	*Midwest Research Lab, Florida Division, Palm Bay*
17.	*Florida*	*Trinity DNA Solutions, Milton*

18.	*Georgia*	*EPA, Region 4, Science and Ecosystem Support Division*
19.	Hawaii	Joint POW/MIA Accounting Command, Central Identification Lab
20.	*Illinois*	*Independent Forensics, Hillside*
21.	*Illinois*	*State Police Crime Scene Services Command – Region II, Sterling*
22.	*Illinois*	*State Police Crime Scene Services Command – Region III, Carlinville*
23.	*Illinois*	*State Police Crime Scene Services Command – Region IV, Effingham*
24.	*Illinois*	*State Police Crime Scene Services Command – Region*
25.	*Indiana*	*Strand Analytical Laboratories, Indianapolis*
26.	Kentucky	Regional Computer Forensics Lab, Louisville
27.	Louisiana	Coroner Forensic Science Center, St. Tammany Parish, Slidell
28.	Maryland	BRT Labs, Baltimore
29.	Maryland	DoD Computer Forensics Lab, Linthicum
30.	Massachusetts	Department of State Police Maynard Central Lab, Maynard
31.	Massachusetts	Department of State Police Southeast Sub-Lab, Lakeville
32.	Massachusetts	Department of State Police Sudbury Central Lab, Sudbury
33.	Massachusetts	Department of State Police Western Satellite West Sub-Lab, Springfield
34.	Massachusetts	State Police Forensic Services Group, Boston Sub-Lab, Boston
35.	Massachusetts	State Police Forensic Services Group, Bourne Sub-Lab, Bourne
36.	Massachusetts	State Police Forensic Services Group, Devens Sub-Lab, Devens
37.	Minnesota	Target Corporation Forensic Services Lab, Minneapolis, Brooklyn Park
38.	Mississippi	Scales Biological Lab., Inc. Brandon
39.	Missouri	Genetic Technologies, Inc., Pacific
40.	Missouri	Heart of America Regional Computer Forensic Lab, Kansas City
41.	Missouri	State Highway Patrol, Troop E Satellite Lab, St. Joseph
42.	*Missouri*	*Paternity Testing Corporation, Columbia*
43.	Nebraska	University of Nebraska, Human DNA Identification Molecular Diagnostics Lab, Omaha
44.	Nevada	Target Corporation Forensic Services Lab, Las Vegas
45.	New Jersey	NJ Regional Computer Forensic Lab, Hamilton
46.	*New Mexico*	*Forensic Testing Laboratories, Inc., Las Cruces*
47.	New York	Westchester County Dept. of Lab and Research Division of Forensic Toxicology, Valhalla
48.	North Carolina	DNA Security, Inc., Burlington
49.	North Carolina	Forsyth County Sheriff's Office Crime Lab., Winston-Salem
50.	North Carolina	Laboratory Corporation of America Holdings DNA Identification
51.	North Carolina	Laboratory Corporation of America Holdings Forensic Identity Testing Laboratory (Labcorp), Research Triangle Park
52.	*North Carolina*	*Laboratory Corporation of America, Burlington*
53.	*North Dakota*	*North Dakota State University, Fargo*
54.	Ohio	DNA Diagnostics Center – Forensic Department, Fairfield
55.	*Ohio*	*Genetica DNA Laboratories, Cincinnati*
56.	Oklahoma	State Bureau of Investigation Forensic Science Center, Edmond
57.	Oregon	Northwest Regional Computer Forensics Lab, Portland
58.	Pennsylvania	MitoTyping Technologies, LLC, State College
59.	Pennsylvania	National Medical Services, Inc., Criminalistics Lab, Willow Grove
60.	Pennsylvania	Philadelphia Regional Computer Forensics Lab., Radnor

61. Puerto Rico — Instituto de Ciencias Forenses, Laboratorio Forense DNA-Serologia, Rio Piedras
62. South Dakota — Identity Genetics, Brookings
63. Tennessee — Aegis Sciences Corporation CRIMES Division, Nashville
64. Tennessee — Orchid Cellmark Nashville Lab, Nashville
65. Texas — Alliance Forensics Lab., Inc., Fort Worth
66. Texas — Arlington Police Department, Crime Lab, Arlington
67. Texas — Armstrong Forensic Lab, Inc., Arlington
68. Texas — Corpus Christi PD Forensic services Division, corpus Christi
69. Texas — CyberEvidence Digital Forensics Lab, The Woodlands, TX
70. Texas — Dallas County Southwestern Institute of Forensic Sciences, Dallas
71. Texas — Harris County Sheriff's Office Firearms Identification Lab, Houston
72. Texas — Hill Schwartz Spilker Keller LLC Computer Forensics Lab, Houston
73. Texas — Integrated Forensic Lab, Inc., Euless
74. Texas — North Texas Regional Computer Forensics Lab, Dallas
75. Texas — Orchid Cellmark Dallas Division, Farmers Branch
76. Texas — Plano Police Department Crime Scene Investigation Unit, Plano
77. Texas — Texas Parks Wildlife Law Enforcement Forensic Lab, San Marcos
78. Texas — United Services Automobile Ass. Digital Forensics Lab, San Antonio
79. Texas — UNT Center for Human Identification, Ft. Worth
80. Utah — American Express Digital Multi-Media Lab, Salt Lake City
81. Utah — Intermountain West Regional Computer Forensic Lab, Salt Lake City
82. Utah — Sorenson Forensics, Salt Lake City
83. Virginia — DC Metro Police Forensic Biology and Trace Evidence Units, Lorton
84. Virginia — The Bode Technology Group, Inc., Lorton
85. Virginia — Fairfax Identity Lab, Richmond
86. West Virginia — Marshall University Forensic DNA Lab, Huntington

APPENDIX 1F: ADDITIONAL RESOURCES RELEVANT TO ACCREDITATION

ASCLD/LAB - www.ascld-lab.org
The American Association for Laboratory Accreditation - www.a2la.org
Forensic Quality Services - www.forquality.org
American Board of Forensic Toxicology - www.abft.org
National Conference of State Legislatures - www.ncsl.org
International Laboratory Accreditation Cooperation - www.ilac.org
Bureau of Justice Statistics - www.bjs.ojp.usdoj.gov
InterAmerican Accreditation Cooperation - www.iaac.org.mx
New York State Accreditation Program for Forensic Laboratories - http://criminaljustice.state.ny.us/legalservices/section6190.htm
National Cooperation for Laboratory Accreditation - www.nacla.net

APPENDIX 2A: DISCIPLINE-SPECIFIC TESTING CATEGORIES WITH ACCREDITING DETAILS AND FEES (2014)

G19 Categories of Testing	Discipline or Sub- discipline	Certification Organization	Contact Info	Accrediting Org	Approx. # of diplomates or certified individuals	Applic. Fee	Exam Fee	Recert.. Fee/year
	Criminalistics	American Board of Criminalistics	www.criminalistics.com	FSAB	553	$50.00	$200.00	$40.00
Controlled Substances	Drug Analysis	American Board of Criminalistics	www.criminalistics.com	FSAB	209	$50.00	$200.00	$40.00
Hairs, Blood, Body Fluids and Tissues	Molecular Biology	American Board of Criminalistics	www.criminalistics.com	FSAB	186	$50.00	$200.00	$40.00
Trace Evidence	Fire Debris	American Board of Criminalistics	www.criminalistics.com	FSAB	50	$50.00	$200.00	$40.00
Trace Evidence	Hairs & Fibers	American Board of Criminalistics	www.criminalistics.com	FSAB	32	$50.00	$200.00	$40.00
Trace Evidence	Paint and Polymers	American Board of Criminalistics	www.criminalistics.com	FSAB	27	$50.00	$200.00	$40.00
Trace Evidence	Glass							
Trace Evidence	Explosives							
Trace Evidence	Soils							
Trace Evidence	Plants							
Entomology	Forensic Entomology	American Board of Forensic Entomology	www.forensicentomologist.org		12	n/a	$125.00	$25.00
	Building Materials							
	DNA							
	Pattern Evidence							
	Trace Evidence							
	Chemistry	American Institute of Chemists/National Certification Commission in Chemistry and Chemical Engineering	www.theaic.org		Outside F.S. Service Providers	$130.00	n/a	$95.00
	Chemical Engineering	American Institute of Chemists/National Certification Commission in Chemistry and Chemical Engineering	www.theaic.org		Outside F.S. Service Providers	$131.00	n/a	$95.00
	Chemical Hygiene Officer	National Registry of Certified Chemists	www.NASc6.org		Outside F.S. Service Providers	$150.00	$175.00	$85.00
Controlled Substances?	Clinical Chemistry	National Registry of Certified Chemists	www.NASc6.org		Outside F.S. Service Providers	$150.00	$175.00	$85.00
Controlled Substances?	Environmental Analytical Chemistry	National Registry of Certified Chemists	www.NASc6.org		Outside F.S. Service Providers	$150.00	$175.00	$75.00
Toxicology?	Toxicological Chemistry	National Registry of Certified Chemists	www.NASc6.org		Outside F.S. Service Providers	$150.00	$175.00	$85.00
Handwriting and Document Examination	Forensic Document Examination	American Board of Forensic Document Examiners	www.abfde.org	FSAB	110	$250.00	n/a	$200.00

Handwriting and Document Examination	Forensic Document Examination	Board of Forensic Document Examination	www.bfde.org	FSAB	17	$100.00	$500.00	$100.00
Fingerprints	Latent Fingerprints	International Association for Identification	www.theiai.org	FSAB	891	$150.00	$300.00	$60.00
Fingerprints	Ten print fingerprints	International Association for Identification	www.theiai.org	FSAB	127	$150.00	$300.00	$60.00
Scene Investigation	Blood stain pattern	International Association for Identification	www.theiai.org	FSAB	49	$150.00	$300.00	$60.00
Scene Investigation	Crime scene-4 levels	International Association for Identification	www.theiai.org	FSAB	1460: Outside F.S. Service Providers	$150.00	$300.00	$60.00
Scene Investigation	Forensic photography	International Association for Identification	www.theiai.org	FSAB	51	$150.00	$300.00	$60.00
Scene Investigation	Evidence Photographer	Evidence Photographers International Council	www.evidencephotographers.com		55	$300.00	$695.00	$139.00
G19 Categories of Testing	**Discipline/Sub-discipline**	**Certification Organization**	**Contact Info**	**Accrediting Organization**	**approx. # of diplomates or certified individuals**	**Application Fee**	**Examination Fee**	**Recertification Fee/year**
Marks and Impression	Footwear	International Association of Identification	www.theiai.org		110	$150.00	$300.00	$60.00
Audio, Video and Computer Analysis	Video	International Association of Identification	www.theiai.org		12	$150.00	$300.00	$60.00
Audio, Video and Computer Analysis	Forensic Artist	International Association of Identification	www.theiai.org		32: Outside F.S. Service Providers	$150.00	$300.00	$60.00
Marks and Impression	Footwear/ Fingerprints	Canadian Identification society	www.cis-sci.ca		NA for U.S.A.	$150.00	n/a	$150.00
Marks and Impression	Impression - Tire tread							
	Evidence Handling	International Association of Property and Evidence	www.IAPE.org		1400+; Outside F.S. Service Provider	$150.00	n/a	$20.00
Firearms and ballistics	Firearms	Association of Firearms & Toolmarks Examiners	www.afte.org		123	n/a	$250.00	$25.00
Marks and Impressions	Toolmarks	Association of Firearms & Toolmarks Examiners	www.afte.org		46	n/a	$250.00	$25.00
	Gunshot Residue	Association of Firearms & Toolmarks Examiners	www.afte.org		40	n/a	$250.00	$25.00
	Serial # Restoration	none						
	Trajectory Reconstruction	none						
Audio, Video and Computer Analysis	Digital Evidence - Digital Forensics Certified Practioner and DFCA	Digital Forensics Computer Board	www.dfcb.org		178	$250.00	$100.00	
Audio, Video and Computer Analysis	Digital Evidence - Certified Computer Examiner (CCE)	International Society of Forensic Computer Examiners	www.isfce.org		805	$395.00	n/a	$75.00

Audio, Video and Computer Analysis	Digital Evidence - Certified Digital Forensic Examiner (CDFE), Certified Digital Media Collector (CDMC), Certified Computer Crime Investigator (CCCI)	DOD Cyber Crime Center	www.dc3.mil		Training source			
Audio, Video and Computer Analysis	Digital Evidence - Certified Forensic Computer Examiner (CFCE)	International Association of Computer Investigation Specialists	www.iacis.com		1120	$750.00	n/a	$100.00
Audio, Video and Computer Analysis	Digital Evidence - Certified Electronic Evidence Collection Specialist Certification (CEECS)	International Association of Computer Investigation Specialists	www.iacis.com		In above total?	$750.00	n/a	$100.00
Audio, Video and Computer Analysis	Digital Evidence - Certified Forensic Analyst, Certified Forensic Examiner, Reverse Engineering Malware, many others	Global Information Assurance Certification	www.giac.org	ANSI	3,312	n/a	$899.00	$100.00
Audio, Video and Computer Analysis	Digital Evidence - Audio							
Audio, Video and Computer Analysis	Digital Evidence - Video							
G19 Categories of Testing	**Discipline/Sub-discipline**	**Certification Organization**	**Contact Info**	**Accrediting Organization**	**approx. # of diplomates or certified individuals**	**Application Fee**	**Examination Fee**	**Recertification Fee/year**
	Forensic Engineering	International Institute of Forensic Engineering Sciences	www.iifes.org	FSAB	16; Outside of F.S. Service Provider	$300.00	n/a	$50.00
	Forensic Engineering	National Academy of Forensic Engineers (NAFE)	www.nafe.org	Council of Engineering and Scientific Specialty Boards (CESB)	Outside of F.S. Service Provider			
	Civil Engineering	American Society of Civil Engineers (ASCE)	www.asce.org	ANSI	Outside of F.S. Service Provider			
Toxicology	Forensic Toxicology	American Board of Forensic Toxicology	www.abft.org	FSAB	254	$150.00	n/a	$100.00
Toxicology	Forensic Toxicology	Forensic Toxicologist Certification Board	http://home.usit.net/~robsears/f_tcb/index.htm		50	$150.00	n/a	$30.00
Toxicology	Forensic Alcohol Toxicology	Forensic Toxicologist Certification Board	http://home.usit.net/~robsears/f_tcb/index.htm		39	$150.00	n/a	$30.00
Toxicology	Forensic Drug Toxicology	Forensic Toxicologist Certification Board	home.usit.net/~robsears/ftcb/in dex		27	$150.00	n/a	$30.00
	Forensic Anthropology	American Board of Forensic Anthropology	www.theabfa.org	FSAB	71	$100.00	$200.00	$150.00

	Forensic Psychology	American Board of Forensic Psychology	www.abfp.com		299: (Outside of F.S. Service Provider)	$125.00	$450.00	n/a
	Forensic Psychiatry	American College of Forensic Psychiatry	www.forensicpsychonline.com		Outside F.S. Service Providers			
	Forensic Psychiatry	American Board of Psychiatry & Neurology	www.abpn.com	American Board of Medical Specialties	Outside F.S. Service Providers	$700.00	$2,300.00	$150.00
	Forensic Nursing	International Association of Forensic Nursing	www.iafn.org		1500+; (Outside of F.S. Service Provider)	n/a	$400.00	$116.00
Odontology	Odontology - Bite Mark	American Board of Forensic Odontology	www.abfo.org	FSAB	160	$400.00	$500.00	$230.00

APPENDIX 2B: ADDITIONAL RESOURCES

Association of Firearms & Toolmarks Examiners - www.afte.org
Digital Forensics Computer Board - www.dcfb.org
International Society of Forensic Computer Examiners - www.isfce.org
DOD Cyber Crime Center - www.dc3.mil
International Association of Computer Investigation Specialists - www.iacis.com
Global Information Assurance Certification - www.giac.org
International Institute of Forensic Engineering Sciences - www.ifes.org
National Academy of Forensic Engineers - www.nafe.org
American Society of Civil Engineers - www.asce.org
American Board of Forensic Toxicology - www.abft.org
Forensic Toxicologist Certification Board - www.ftcb.org
American Board of Forensic Anthropology - www.theabfa.org
American Board of Forensic Psychology - www.abfp.com
American College of Forensic Psychiatry - www.forensicpsychonline.com
American Board of Psychiatry & Neurology - www.abpn.com
International Association of Forensic Nursing - www.iafn.org
American Board of Forensic Odontology - www.abfo.org

APPENDIX 3A: AMERICAN BOARD OF MEDICAL SPECIALTIES[34]

Established in 1933, the American Board of Medical Specialties (ABMS), a not-for-profit organization comprising 24 medical specialty Member Boards, is the pre-eminent entity overseeing the certification of physician specialists in the United States. The primary function of ABMS is to assist its Member Boards in developing and implementing educational and professional standards to evaluate and certify physician specialists. By participating in these initiatives, ABMS also serves as a unique and highly influential voice in the healthcare industry, bringing focus and rigor to issues involving specialization and certification in medicine. ABMS is a designated primary equivalent source of credential information.

Medical specialty certification in the United States is a voluntary process. While medical licensure sets the minimum competency requirements to diagnose and treat patients, it is not specialty specific. Board certification—and the Gold Star—demonstrate a physician's exceptional expertise in a particular specialty and/or subspecialty of medical practice.

The Gold Star signals a board certified physician's commitment and expertise in consistently achieving superior clinical outcomes in a responsive, patient-focused setting. Patients, physicians, healthcare providers, insurers and quality organizations look for the Gold Star as the best measure of a physician's knowledge, experience and skills to provide quality healthcare within a given specialty.

ABMS is an organization of medical specialty boards with shared goals and standards related to the certification of medical specialists. Certification includes initial specialty and subspecialty certification and maintenance of certification throughout the physician's career. The mission of the ABMS is to maintain and improve the quality of medical care by assisting the Member Boards in their efforts to develop and utilize professional and educational standards for the certification of physician specialists. The intent of both the initial certification of physicians and the maintenance of certification is to provide assurance to the public that a physician specialist certified by a Member Board of the ABMS has successfully completed an approved educational program and evaluation process which includes components designed to assess the medical knowledge, judgment, professionalism and clinical and communication skills required to provide quality patient care in that specialty. The ABMS serves to coordinate the activities of its Member Boards and to provide information to the public, the government, the profession and its Members concerning issues involving certification of physicians.

Since 1933, official recognition of specialty boards in medicine has been achieved by the collaborative efforts of the Advisory Board for Medical Specialties, its successor, the American Board of Medical Specialties, and the AMA Council on Medical Education. In 1948 these efforts were formalized through the establishment of the Liaison Committee for Specialty Boards (LCSB). A jointly approved publication, "Essentials for Approval of Examining Boards in Medicine Specialties," established standards. This document has undergone several revisions through the years and remains the standard for recognition of new specialty boards.

From 1933 to 1970, the Advisory Board operated as a federation of individual specialty boards. It functioned primarily as a forum for discussion without the benefit of a full-time director or a central office from which to conduct its daily operations. This changed in 1970 when the Advisory Board was

[34] www.abms.org

reorganized as the American Board of Medical Specialties. A new category of "Conjoint Board" was also created and the Bylaws were revised to provide for the category of "Regular Member" for Primary and Conjoint Boards and the category of "Associate Member" for member organizations that were not specialty boards. A formal funding mechanism was established on the basis of a dues assessment for each Member Board and Associate Member.

The official ABMS Member Boards and Associate Members are (year approved as an ABMS Member Board in parentheses):

- Allergy and Immunology (1971)
- Anesthesiology (1941)
- Colon and Rectal Surgery (1949)
- Dermatology (ABMS Founding Member)
- Emergency Medicine (1979)
- Family Medicine (1969)
- Internal Medicine (1936)
- Medical Genetics (1991)
- Neurological Surgery (1940)
- Nuclear Medicine (1971)
- Obstetrics and Gynecology (ABMS Founding Member)
- Ophthalmology (ABMS Founding Member)
- Orthopaedic Surgery (1935)
- Otolaryngology (ABMS Founding Member)
- Pathology (1936)
- Pediatrics (1935)
- Physical Medicine and Rehabilitation (1947)
- Plastic Surgery (1941)
- Preventive Medicine (1949)
- Psychiatry and Neurology (1935)
- Radiology (1935)
- Surgery (1937)
- Thoracic Surgery (1971)
- Urology (1935)

The approved Member Boards of ABMS certify specialists in more than 145 specialties and subspecialties. The primary function of each of these boards is to evaluate candidates in its primary specialty and subspecialty areas who voluntarily appear for review and to certify those qualified as "diplomates" or "subspecialists" of that board. This is accomplished through a comprehensive process involving educational requirements, professional peer evaluation and examination.

The Member Boards also work in collaboration with other professional organizations and agencies to elevate the standards of graduate medical school education. Accreditation review for the approval of residency training programs in each specialty however, is conducted by a Residency Review Committee (RRC) through the Accreditation Council for Graduate Medical Education (ACGME).

The governing body of each individual specialty board comprises specialists qualified in the particular field represented by that board. Members of the governing bodies include representatives from among the national specialty organizations in related fields.

Since 1933, specialty boards have been approved jointly by action of ABMS and the American Medical Association Council on Medical Education (AMA/CME). This determination begins with a review by the Liaison Committee for Specialty Boards (LCSB), an organization sponsored by ABMS and AMA/CME. The function of LCSB is to receive and evaluate applications for approval of new specialty boards according to standards and procedures agreed upon by both ABMS and AMA.

Certification by an ABMS Member Board involves a rigorous process of testing and peer evaluation that is designed and administered by specialists in the specific area of medicine.

At one time, physicians were awarded certificates that were not time-limited and therefore did not have to be renewed. Later, a program of periodic recertification (every six to 10 years) was initiated to ensure physicians engaged in continuing education and examination to keep current in their specialty.

However, in 2006, ABMS' 24 Member Boards adopted a new gold standard for re-certification with a continuous ABMS Maintenance of Certification (MOC) program for all specialties. MOC uses evidence-based guidelines and national standards and best practices in combination with customized continuing education so physicians demonstrate their leadership in the national movement for healthcare quality. MOC also requires proof of continuing education and experience in between testing for re-certification.

There are 24 Member Boards of ABMS, including:

- The American Board of Allergy and Immunology
- The American Board of Anesthesiology
- The American Board of Colon and Rectal Surgery
- The American Board of Dermatology
- The American Board of Emergency Medicine
- The American Board of Family Medicine
- The American Board of Internal Medicine
- The American Board of Medical Genetics
- The American Board of Neurological Surgery
- The American Board of Nuclear Medicine
- The American Board of Obstetrics and Gynecology
- The American Board of Ophthalmology
- The American Board of Orthopaedic Surgery
- The American Board of Otolaryngology
- The American Board of Pathology
- The American Board of Pediatrics
- The American Board of Physical Medicine and Rehabilitation
- The American Board of Plastic Surgery
- The American Board of Preventive Medicine
- The American Board of Psychiatry and Neurology
- The American Board of Radiology

- The American Board of Surgery
- The American Board of Thoracic Surgery
- The American Board of Urology

APPENDIX 3B: AMERICAN BOARD OF MEDICOLEGAL DEATH INVESTIGATORS (ABMDI) CERTIFICATION[35]

I. Registry Certification (basic)

The Registry certification is the initial certification that provides official recognition that an individual has acquired basic knowledge and demonstrated proficiency in the standards of practice necessary to properly conduct a competent, thorough medicolegal death investigation.

Eligibility

1. Must be at least eighteen years of age at time of application.
2. Must have a high school diploma or equivalent.
3. Must currently be employed in a Medical Examiner or Coroner office or equivalent military authority with the job responsibility to "conduct death scene investigations" at time of application **and** examination.
4. Must have a minimum of 640 hours of death investigation experience

   Note: If you are currently employed by a ME/Coroner office full time, you will have accumulated 640 hours in four months. If you are employed part time, you must have accumulated 640 hours within the past year:

   - *Each on-call hour = 0.25 hours*
   - *Investigation of a natural death, no scene investigation = 1 hour*
   - *Investigation of non-natural death, no scene investigation = 2.5 hours*
   - *Investigation of a death with scene investigation = 5 hours*

DISCLAIMER: Currently, the ABMDI does not endorse any program that claims to fulfill the requirements of certification or prepare an individual for the certification exam.

Application Process

Applications are available upon receipt of an application request form. The $50 non-refundable application fee must accompany the request form.

Included in the Registry application packet:

[35] http://medschool.slu.edu/abmdi/index.php.

1. Application Form (Code of Ethics included)
2. Employment Verification Form verifying 640 hours of work experience and current employment in a Medical Examiner/Coroner office or equivalent military authority with the primary responsibility of death investigation (requires notarization). *this requirement applies to application and examination
3. Reference form
4. Performance Training Guidebook Checklist with ABMDI instructions (see below for more details).

In order to be eligible to sit for the Registry exam, the individual must complete the application packet in its entirety. *Note: Applicants who begin the process within one jurisdiction and subsequently move to another, must provide a notarized employment verification form from each jurisdiction indicating the length of employment.*

Application materials must be completed in their entirety and returned to the ABMDI office at least 30 days prior to the desired examination date.

There is an 18 month time limit to complete the application process and sit for the exam. If, after 18 months, you have not completed all application requirements or tested, your file will become inactive and your application fee will be forfeited. You will then have to reapply and pay the application fee in order to start the process again.

Medicolegal Death Investigators have standards of practice that require performance of specialized, technical skills, e.g., initial body examination at the scene, drawing postmortem specimens for analysis, etc. There are many specialized procedures that are fundamental and are necessary to perform a thorough medicolegal death investigation. Proof that an individual is experienced in correctly performing these tasks is required to show his/her competency. Successful performance of all 300+ tasks identified in the **Performance Training Guidebook Checklist** must be verified in writing by a competent practitioner working in the field who has personal knowledge that the applicant can perform the task independently and correctly.

You may have as many people as necessary sign off on the Checklist showing that you have completed the tasks. You must also go through hands-on training to complete the checklist, for example:

- Actual death scene field work experience including body evaluation at the death scene and producing appropriately documented reports of death
- Autopsy lab including body evaluation and drawing specimens
- Role-play (creating scenarios that address training issues including mock scenes, etc.)
- Other forensic lab work involving anthropology, odontology, postmortem evaluation, medical record review, etc.

  (NOTE: It is understood that some jurisdictions do not perform certain identified tasks due to statute, policy or procedure. However, that does not preclude an applicant from receiving appropriate training in that area. If such issues arise, the applicant is encouraged to contact ABMDI for direction to determine how to best satisfy those specific requirements.)

When the entire Checklist is completed at an independent level, the back cover should be notarized and returned to the ABMDI office for processing.

Registry Examination

The scope of knowledge for the Registry exam is defined in the National Institutes of Justice publication *Death Investigation: A Guide for the Scene Investigator* and further defined in the Performance Training Guidebook Checklist. For an online practice test, you can visit Occupational Research and Assessment.

The 240 multiple choice examination covers factual knowledge, technical information, understanding the principles and problem-solving abilities related to the profession. Exams are offered online. There is an additional fee for paper/pencil format. The examination is divided into eight sections as outlined in the Checklist and in the *Medicolegal Death Investigator* training text (Clark, Ernst, Jentzen, and Haglund, 1994). This text may be purchased from Occupational Research and Assessment. Examinations are administered at local colleges or universities through their testing departments. You have up to four hours to complete all eight multiple choice sections, which are:

1. Interacting with Federal, State and Local Agencies
2. Communicating
3. Interacting with Families
4. Investigating Deaths
5. Identifying and Preserving Evidence
6. Maintaining Ethical and Legal Responsibilities
7. Demonstrating Scientific Knowledge
8. Coping with Job-Related Stress

Registry Recertification

In order to continue with certification, the Diplomate must:

1. Be considered in good standing (current in all fees)
2. Demonstrate continued competency (completed work verification form or see below)
3. Reaffirm the Code of Ethics in writing
4. Provide documentation of 45 hours of *approved* continuing education in the continuing education folder provided upon successful completion of passing the exam

The ABMDI is accredited by the Forensic Specialties Accreditation Board (FSAB), which requires proof of continued competency in order to be recertified. Continued competency includes current employment or demonstration of consulting, teaching, providing seminars or presentation of papers. These activities may be performed on a voluntary basis. Proof of these activities will be required, if you are not currently working for a medical examiner/coroner jurisdiction with the responsibility of investigating deaths.

Registry Certification Fees

Non-refundable Application Fee: **$50**

Non-refundable online Examination Fee: **$350**
*Paper/pencil format of exam: **$50** additional fee
After certification, yearly maintenance fee: **$40**

II. Board Certification (advanced)

Board Certification is available to experienced registered medicolegal death investigators who prove their mastery of all aspects of medicolegal death investigation. In order to be eligible to apply, you must:

- Currently be certified at the ABMDI Registry Level and in good standing for a minimum of six months.
- Have at least an Associates degree from a post secondary institution recognized by a national educational accrediting agency.
- Currently be employed in a Medical Examiner/Coroner jurisdiction or equivalent military authority with the job responsibility to "conduct scene investigation".
- Have a minimum of 4,000 hours of experience in the past six years.

  NOTE: If you are currently employed by an M.E./Coroner's office full time, you will have accumulated 4,000 hours in two years. If you are employed part time, you must have accumulated 4,000 hours within the past six years.

  "On-Call" time accumulates as follows:

  a. Each on-call hour = 0.25 hours
  b. Investigation of a natural death, no scene investigation = 1 hour
  c. Investigation of a non-natural death, no scene investigation = 2.5 hours
  d. Investigation of a death with scene investigation = 5 hours

Application Process

Applications are available upon receipt of an application request form. The $100 non-refundable application fee must accompany the request form. ***Application materials must be completed in their entirety and returned to the ABMDI office at least 30 days prior to the desired examination date.***

Included in the Board Certified application packet:

1. Application Form (Code of Ethics included)
2. Employment Verification Form (requiring notarization by a third-party notary)
3. Forensic Science Specialist Reference form
4. Administrator/Supervisor Reference form
5. Law Enforcement Reference form

In addition to the forms above, you must submit either a copy of an Associates Degree or a letter from the Registrar's Office of your college or university verifying your college degree. Transcripts are not necessary; all we need is verification of your degree.

There is an 18-month time limit to complete the application process. If, after 18-months, you have not completed all application requirements and scheduled an examination, your Board Certification file will become inactive. You will have to reapply and pay the application fee again in order to start the process.

Board Certification Recertification

In order to continue Board Certification status, the Fellow must

1. Be in good standing (current in all fees)
2. Reaffirm in writing the Code of Ethics
3. Currently be employed with a medical examiner/coroner jurisdiction with the responsibility to conduct scene investigations or show current competency
4. Submit 45 hours of approved continuing education in the continuing education folder provided to the Fellow upon successful completion of the examination

The ABMDI is accredited by the Forensic Specialties Accreditation Board (FSAB), which requires proof of continued competency in order to be recertified. Continued competency includes current employment or demonstration of consulting, teaching, providing seminars or presentation of papers. These activities may be performed on a voluntary basis. Proof of the activities must be submitted if the Fellow is not currently employed by a medical examiner/coroner jurisdiction with the responsibility of conducting scene investigations.

Board Certification Examination

The scope of knowledge for the Board Certified exam will rely heavily on the applicant's cumulative experience and further training in medicolegal death investigation. It can include independent study and attendance at workshops, seminars, and other training venues. As a minimum, and given that the examination is broad based and encompasses the Forensic Sciences, the applicant is required to have an Associate Degree.

The 5.5 hour examination is administered online at local colleges and universities. It is divided into two parts:

1. A Performance Section--This portion consists of three medicolegal death scene scenarios. You will be asked to:
    a. Write a narrative description of the scene in the space provided **using medical terminology.**
    b. Develop a set of up to 10 questions that could be used to interview witnesses and/or suspects
    c. Develop a list of up to 5 pieces of potential evidence.

    All answers should be based solely on information provided in the case scenario and depicted in the scene photographs. Since you only have **30 minutes** for each case, you DO NOT need to interpret findings, solve the case or develop a complete case report.

2. A Multiple Choice Section--This portion consists of 240 multiple choice test items. You have up to 4 hours to complete this, which is divided into the following 8 sections:
    a. Investigating Specific Death Scenes
    b. Investigating Multiple Fatalities
    c. Investigating Atypical Death Scenes
    d. Investigating Institutional Deaths
    e. Demonstrating Leadership Skills
    f. Demonstrating Legal Knowledge
    g. Communication Skills
    h. Demonstrating Advanced Forensic Science Knowledge

These sections are based on the Advanced Skills List included in your application packet.

Board Certification Fees

1. Non-refundable Application Fee: **$100**
2. Non-refundable Examination Fee: **$400**
3. * Additional fee of **$50** if paper/pencil test requested.
4. After certification, yearly maintenance fee: **$40**

APPENDIX 3C: THE AMERICAN BOARD OF PATHOLOGY (ABP) REQUIREMENTS FOR CERTIFICATION IN ANATOMIC PATHOLOGY AND FORENSIC PATHOLOGY[36]

Description of Examinations

All examinations given by the American Board of Pathology are multiple-choice, computerized examinations given at the ABP examination center in Tampa, Florida. The examinations do not require any special computer skills or experience. A practice session is held before the certification examination begins. It is important that candidates read and understand all material sent in advance by the ABP and that candidates for anatomic pathology go through the practice examination in virtual microscopy that is available on the ABP Web site.

A. Primary Certification

1. AP/CP candidates may not apply for any part of the AP/CP examination until all training requirements are completed.
2. Candidates must pass both the written and practical portions of the AP and/or CP examinations in the same administration in order to pass the primary examination.
3. Candidates for combined AP/CP certification will not be certified by the ABP until both AP and CP examinations are passed and all other requirements are met.

[36] *Instruction and Information for Candidates for Certifying Examinations 2010.* The American Board of Pathology (http://www.abpath.org)

4. Candidates who completed training in 2008 or later must complete all certification requirements within 5 years from the completion of training. During the qualification period a candidate may take each part of the AP and CP examinations a maximum of five times.

B. Subspecialty Certification

1. Candidates must pass both written and practical portions of the examination in the same administration in order to pass the subspecialty examination.
2. Candidates who completed training in 2008 or later must complete all certification requirements within 5 years from the completion of training (or from the date of primary certification, whichever is later). During the qualification period a candidate may take the subspecialty examination a maximum of five times.

C. Application

1. Application forms for primary and subspecialty certification are available online through PATHway on the ABP Web site (http://www.abpath.org). All applications must be completed and submitted online. No paper applications will be accepted.
2. The ABP accepts credit card payments only (MasterCard, Visa, American Express). Checks are no longer accepted. Payment must be made online at the time of the application in order for the application to be submitted.

D. Fees

1. The examination-application fee includes a nonrefundable administrative fee of $100.
2. If an AP/CP applicant takes the AP and CP examinations at different times, there is a separate examination fee for each sitting.
3. See Exam Fee Schedule on the ABP Web site (http://www.abpath.org).

E. Date Assignments

1. Date assignments for all examinations are made by the ABP.
2. If a candidate is unable to accept a date assignment, he/she may transfer the exam fee (minus a transfer fee of $500) to a future administration of the examination.
3. Transfers cannot be made within the same examination period.
4. Special requests for date assignments cannot be accepted.

Requirements for Certification in Anatomic Pathology

1. 36 months of full-time training in an accredited APCP or AP program. Training must include at least 24 months of structured AP training. The remaining 12 months are flexible; and may include AP and/or CP. Training may include up to 6 months of research done during the pathology training program with the approval of the program director.
2. Applicant must have performed at least 50 autopsies at the time the application for certification is submitted. See autopsy requirements under Combined AP/CP Certification (III.B.1).
3. Candidates already certified in CP must have an additional 24 months of full-time training in AP including 18 months of structured training in AP. The remaining 6 months are flexible but must be in one or more areas of AP. The autopsy requirements must be met as described under Combined AP/CP Certification (III.B.1).

Description of Examination

The anatomic pathology examination is a one-day, computer-based examination consisting of written and practical sections. The practical section is composed of a microscopic portion (traditional and virtual) and an image section. A candidate must pass both the written and the practical portions in the same administration in order to pass the examination. All questions are multiple-choice and are in the one-best-answer format. The examination is administered as follows:

Section	Questions	Time
Written	141	2.25 hours
Practical		
Images	108	1.75 hours
Microscopic/virtual	50/26*	3.5 hours

*Note: change from 2009.

Approximately 70% of the total examination is devoted to questions related to pathology of specific organ systems or multi-system disease. The remaining 30% of the examination deals with general pathology and laboratory management. General pathology topics include cellular injury, inflammation and repair, physical and chemical injury, congenital and genetic diseases, neoplasia, circulatory disturbances, molecular pathology, and infections. The number of questions related to a particular system or to a topic in general pathology is roughly correlated with the frequency with which the general pathologist receives specimens or encounters diseases in these areas. Questions related to any topic may be placed in the setting of any area of anatomic pathology of adults and children including surgical pathology, cytology, autopsy, or forensic pathology. The examination also includes questions on hematopathology and molecular pathology, which accounts for approximately 10-15% of the examination. Laboratory management questions may be related to quality assurance, safety, billing, inspection and accreditation processes, federal regulations, personnel issues, costs of running a laboratory, informatics, and other aspects of management.

Images used on the practical examination include gross specimens, histopathologic specimens, electron micrographs, karyotypes, pedigrees, and cytopathology specimens of various types (liquid-based preparations, fine-needle aspirates, cell blocks, etc.). A variety of histochemical and immunochemical stains may be used as well as molecular pathology preparations.

Requirements for All Subspecialty Certifications

1. Candidate must have a primary certification from the ABP, RCPSC (pediatric pathology only), or current primary or subspecialty certification with another ABMS Board.
2. Candidates for combined primary/subspecialty certification must have passed the primary examination before they will be allowed to sit for the subspecialty examination.
3. Residents may not receive credit toward subspecialty certification for subspecialty training that occurred as part of the training requirement for primary certification.

4. Resident must complete at least 2 years of training in APCP, AP, or CP before beginning subspecialty training, except for Dermatopathology in which completion of all primary certification training requirements prior to the fellowship is required.
5. Applicants who completed training 10 or more years prior to application must have successfully completed 6 months of additional pathology training in an ACGME-accredited training program in the area(s) in which certification is desired.
6. Modified training (part-time training) for subspecialty certification is acceptable if the part-time training occurs in an approved position in an ACGME-accredited program. The duration of training may not exceed twice that required for qualification.

Forensic Pathology Certification

For applicants who are certified in anatomic pathology and clinical pathology or anatomic pathology only: 1 full year of additional training in forensic pathology in a program accredited for such training by the ACGME.

Description of Examination for Forensic Pathology Certification

The examination in forensic pathology is a one-day, computer-based examination consisting of written and practical sections. The practical section is composed of a microscopic portion (traditional and virtual) and an image section. The examination is administered as follows:

Section	Questions	Time
Written	125	1.75 hours
Practical		
Images	125	2.25 hours
Microscopic/virtual	50/0	3 hours

A candidate must pass both the written and the practical portions of the examination in the same administration in order to pass the examination. All questions are multiple-choice and in the one-best-answer format. Questions related to microscopic slides may be accompanied by an image or images (scene photograph, gross photograph, radiograph, etc). The questions are designed to measure the candidate's body of knowledge and problem-solving ability.

Subject areas covered include, but are not limited to:

• Pathology and interpretation of natural disease, therapy, and trauma

• Interpretation of injury patterns and stigmata

• Pathology and certification of natural and violent deaths

• Interpretation of clinical and postmortem chemistries and toxicologies

• Molecular biology, forensic odontology, physical anthropology

• Criminalistics, public health, jurisprudence, management, and safety

Acceptable Combinations of Certification and Required Training:

Anatomic Pathology and Forensic Pathology—2 full years of approved training in anatomic pathology in a program accredited for such training by the ACGME, 1 full year of approved training in forensic pathology in a program accredited for such training by the ACGME, and 1 additional year of approved training in another area of pathology such as neuropathology, toxicology, or chemical pathology. ABP approval for the additional year must be obtained before the individual begins the additional year.

APPENDIX 3D: ACCREDITED TOXICOLOGY LABORATORIES AND MEDICAL EXAMINER AND CORONER OFFICES

	Laboratory	State	Accrediting Body
1.	Benton County Coroner's Office (Rogers, Arkansas)	AR	IACME
2.	Office of the State Medical Examiner - Arkansas State Crime Laboratory, Little Rock	AR	NAME - Provisional
3.	Office of the ME Forensic Science Center, Phoenix, AZ	AZ	ABFT
4.	County of San Diego ME's Office/Forensic Toxicology Lab, CA	CA	ABFT
5.	Los Angeles County Chief Medical Examiner/Coroner Office, Los Angeles	CA	NAME - Full Accreditation
6.	Sacramento County Coroner's Office - Sacramento, CA	CA	NAME - Full Accreditation
7.	San Diego County Medical Examiner Office, San Diego, California	CA	NAME - Full Accreditation
8.	San Francisco Office of Chief Medical Examiner, San Francisco	CA	NAME - Full Accreditation
9.	San Bernardino County Sheriff-Coroner Department, San Bernardino	CA	NAME - Provisional

10.	Summit County Office of the Coroner (Colorado)	CO	IACME
11.	Denver Office of the Medical Examiner, Denver	CO	NAME - Full Accreditation
12.	El Paso County Coroner/Medical Examiner Facility, Colorado Springs	CO	NAME - Full Accreditation
13.	Larimer County Medical Examiner's Office, Loveland	CO	NAME - Full Accreditation
14.	Connecticut-Office of Chief medical Examiner, Farmington	CT	NAME - Full Accreditation
15.	Office of the Chief Medical Examiner, Washington, DC	DC	NAME - Provisional
16.	Office of Chief Medical Examiner, Wilmington	DE	NAME - Full Accreditation
17.	District 21 Medical Examiner Office, Ft. Myers, FL	FL	NAME - Full Accreditation
18.	District 5 Medical Examiner's Office, Leesburg	FL	NAME - Full Accreditation
19.	District Six Medical Examiner Office, Largo	FL	NAME - Full Accreditation
20.	Volusia County Medical Examiner's Office, Daytona Beach	FL	NAME - Full Accreditation

APPENDIX 3E: ADDITIONAL RESOURCES

Bureau of Justice Statistics - www.bjs.ojp.usdoj.gov
National Association of Medical Examiners - www.thename.org
International Association of Coroners and Medical Examiners - www.theIACME.com
American Board of Medicolegal Death Investigators - http://medschool.slu.edu/abmdi/index.php
American Board of Pathology - www.abpath.org
American Board of Medical Specialties - www.abms.org

APPENDIX 4A: COST ESTIMATES FOR IMPLEMENTING A PROFICIENCY TESTING PROGRAM

The total cost of achieving universal proficiency testing of forensic science service providers is very difficult to estimate given large uncertainties regarding the number, type, and organizational structures of the Nation's forensic laboratories and related entities; the services they provide; and the number of practitioners that would be affected in various ways.

The table below depicts estimated costs of creating and maintaining proficiency test programs for one forensic science service provider (as of 2011), based on information gathered by SoFS from proficiency test providers, accrediting bodies, and other sources.[37] The cost for second-party recognition of a proficiency test provider will vary depending on the number of categories of testing in which the provider offers tests and the number of participants on the audit team (typically 1-2 for a single category of testing). Estimated costs provided by an accrediting body are $1300 for the first auditor and $500 for each additional auditor. Costs typically include all travel expenses (flight, lodging, meals, parking, etc.).

Table 1: Estimated Cost for a Proficiency Test Provider to Obtain Accreditation under ISO 17043

	Initial Assessment	1st Year Surveillance	2nd Year Surveillance	3rd Year Surveillance
Cost of Assessor				
Total estimated billable hours (travel, onsite visit, stats,	**40**	**30**	**8**	**8**
Cost ($150/hr)	**$6,000**	**$4,500**	**$1,200**	**$1,200**
System Fees				
Initial Application	**$800**	**0**	**0**	**0**
Annual Fee	**$1,300**	**$1,300**	**$1,300**	**$1,300**
Cost	**$2,100**	**$1,300**	**$1,300**	**$1,300**
Total per year	**$8,100**	**$5,800**	**$2,500**	**$2,500**

Table 2: Cost of Proficiency Testing in the Context of Overall Accreditation Costs for Forensic Science Service Providers (FY 2011)*

	Size of FSSP		
	Small	**Medium**	**Large**
Accrediting Body Costs including consultation and inspection fees and yearly fees and surveillance visits	$1500/analyst/year	$1000/analyst/year	$500/analyst/year
Proficiency Testing*	$1000/analyst/year	$2000/analyst/year	$2000/analyst/year
Continuing Education/Training	$2000/analyst/year	$2000/analyst/year	$2000/analyst/year
QA Staffing	$120,000/year	$120,000/year	$240,000/year
Equipment Calibration - Initial	$15,000	$20,000	$25,000
Equipment Calibration - Yearly Maintenance	$5,000	$10,000	$15,000
Variables			
Practitioners	≤5	6 to 15	>15
Disciplines	1 to 2	3 to 6	7+
Sites	1	1	1+

*Note these data are from a time at which most if not all proficiency test providers were still not ISO/IEC 17043 accredited; with higher rates of such accreditation now in place, costs may vary.

Table 3: Estimated Cost of Proficiency Testing in the Context of Overall Accreditation Costs for Medical Examiner/Coroner offices (FY 2011)

	Accrediting Body		
	NAME	**IACME**	**ABFT**
Accrediting Body Costs	$2500/office/system	$2500/office	$4000/laboratory
Annual Maintenance Fee	$1000/office system	$1000/office/system	$1000/laboratory
Proficiency Testing*	n/a	n/a	$1000/practitioner/yr

Continuing Education/Training	$1000/practitioner/yr	$1000/practitioner/yr	$2000/practitioner/yr
QA Staffing	$120,000/year	$120,000/year	$120,000/year
Equipment Calibration - Initial	$5,000	$5,000	$20,000
Equipment Calibration - Yearly	$5,000	$5,000	$10,000

Appendix 4B: Proficiency Test Accreditation Bodies and Proficiency Test Providers

Accrediting Bodies
A2LA – American Association for Laboratory Accreditation
ABFT – American Board of Forensic Toxicology
ASCLD/LAB – American Society of Crime Laboratory Directors/Laboratory Accreditation Board
FQS-I – Forensic Quality Services (follows ILAC G-19)
IACME – International Association of Coroners and Medical Examiners
NAME – National Association of Medical Examiners

Proficiency Test Providers (as of 2013)
CTS – Collaborative Testing Services
CAP – College of American Pathologists
CAS – Competency Assessment Services
CATTT – Creative Approaches to Teaching, Training, and Testing
CSOC – Crime Scene On Call
DFQS – Digital Forensics Quality Systems
FIP – Forensic Identity Program
FTS – Forensic Testing Services
ISFCE – International Society of Forensic Computer Engineers
NIFS – National Institute of Forensic Services
ORCHID – Orchid Cellmark
QD – Quo Data
RV – Resolution Video
SERI – Serological Research Institute

APPENDIX 4C: THE THREE COMPONENTS OF PROFICIENCY TESTING

Accreditation Body

Define how proficiency tests are designed, administered, and reviewed.

ASCLD/LAB, FQS-1, A2LA, NAME, IACME, ABFT

Proficiency Testing Provider (PTP)

To conduct external proficiency tests, a PFP must be accredited to ISO/IEC 17043 standards by accreditation bodies.

CTS, CAP, CAS, CATT, CSOC, DFQS, FIP, FTS, ISFCE, NIFS, ORCHID, QD, RV, SERI

Forensic Science Service Provider (FSSP)

If discipline specific proficiency tests are not available through PTPs, FSSPs may substitute internal proficiency tests conforming to the ISO/IEC 14073 standard.

National Science and Technology Council

Committee on Science

Subcommittee on Forensic Science

Representatives of Member Departments and Agencies

Department of Commerce

Department of Defense

Department of Energy

Department of Health and Human Services

Department of Homeland Security

Department of Interior

Department of Justice

Department of Treasury

Environmental Protection Agency

National Science Foundation

National Transportation Safety Board

Office of the Federal Public Defender

United States Postal Inspection Service

Smithsonian Institution

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