STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES:

A PATH FORWARD

Statement of

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Chairman Wu and distinguished Committee members, it is indeed an honor and a privilege to appear before you today. As the lone Medical Examiner and death investigation professional among the witnesses, I believe I offer a unique perspective on several of the issues raised in the National Research Council (NRC)'s report. I speak here today as a practitioner, a board-certified Forensic Pathologist, and a member of several professional organizations (including The National Association of Medical Examiners (NAME)[1] and The American Academy of Forensic Sciences (AAFS).[2] I do not speak for these organizations but their views have certainly helped shape my opinions. I speak as someone who has seen the pinnacles of investigative success the present system has to offer and one who has seen shameful mistakes. Most importantly, I speak as a concerned citizen who genuinely desires the improvements the forensic sciences and all those who use those services deserve. I speak as a son who lost a mother suddenly and had to wait for answers – and when those answers came, it left many in my family with more questions than solace. For my father, he experienced the same fate a generation earlier when his mother had no examination conducted as a lay investigator deemed it "unnecessary."

I was asked to review the scientific and technical issues raised by the NRC Report on Forensic Sciences and how the National Institute of Standards and Technology might fit into that picture. I should like to address my remarks primarily to the discipline of Forensic Pathology and medicolegal death investigation (see recommendation #11), which I see as a microcosm of the issues involving the forensic Sciences as a whole. I think that perhaps Sir William Gladstone best summed it up: "Show me the manner in which a nation cares for its dead and I will measure with mathematical exactness the tender mercies of its people, their respect for the laws of the land, and their loyalty to high ideals."

The focus of the entire "status of forensics" to me comes down to uniformity and best practices (see NRC recommendation #2). A different quality of death investigation should not depend on where one has the misfortune of dying. Surviving family members and the courts should not be forced to wait because a motor vehicle crash victim didn't quite make it over the state line to a better jurisdiction. In order to ensure that all forensic autopsies are created equal, NAME developed and implemented Forensic Autopsy Performance Standards in 2006.[3] Experienced practitioners formulated guidelines that were carefully considered and adopted by the

[1] The National Association of Medical Examiners (NAME) is the national professional organization of physician medical examiners, medical death investigators and death investigation system administrators who perform the official duties of the medicolegal investigation of deaths of public interest in the United States. NAME was founded in 1966 with the dual purposes of fostering the professional growth of physician death investigators and disseminating the professional and technical information vital to the continuing improvement of the medical investigation of violent, suspicious and unusual deaths. Growing from a small nucleus of concerned physicians, NAME has expanded its scope to include physician medical examiners and coroners, medical death investigators and medicolegal system administrators from throughout the United States and other countries.

[2] The American Academy of Forensic Sciences is a multi-disciplinary professional organization that provides leadership to advance science and its application to the legal system. The objectives of the Academy are to promote education, foster research, improve practice, and encourage collaboration in the forensic sciences.

[3] Forensic Autopsy Performance Standards, http://thename.org/index.php?option=com_docman&task=cat_view&gid=45&Itemid=26

membership at large. The intent was to create a procedure whereby the technical aspects of the performance of the forensic autopsy were consistent from jurisdiction to jurisdiction in order to guarantee a quality product. Are there very real and very serious problems when best practices are not followed? One need only look at recent[4,5] events regarding autopsies by un-boarded, non-Forensic Pathologist examiners to see the consequences. Truly those who do not learn from the mistakes of the past are destined to repeat them.

When Forensic Medicine is practiced as it should be – thoughtfully, completely, accurately, and impartially – everyone benefits. The scientific foundation of medicine is unquestioned. Medicine fought some battles similar to those pointed out in The NRC report at the same point in the last century with end result being a revolution in medical education and practice.[6,7] The net result was enhanced confidence in how the science was applied. The other forensic disciplines are on a similar road to ours but at several different points on their journeys. I think that, in general, the scientific underpinnings are there but certainly the disciplines would benefit from a more formal structured review. Look at it this way, a race car driver can be incredibly proficient on the track. The net result of the NRC report is that the same racing champion now has to go back and get a driver's license to document that they can in fact do what they already do so well.

All the efforts to improve medicolegal death investigation are designed to enhance service delivery to those who rely on the results of the forensic autopsy. In addition to the obvious impact Forensic Pathology has on the justice system, Medical Examiners have important and sometimes under-recognized duties in public health, medical research, and homeland security/mass disaster preparedness. Recognition of potentially infectious diseases from the performance of the autopsy may assist to minimize illness and death. Injuries found at autopsy were a large part of the development of automotive seatbelts and airbags. By studying sudden deaths, certain commonalities may be found and medical science advanced. Our understanding of many deaths, including those resulting from violence, can protect the living, for example by identifying inherited diseases or dangerous drug combinations. In the arena of disaster preparedness, the Medical Examiner is responsible for the medical investigation in mass fatality incidents, including identification of victims and the determination of the cause and manner of death – the Medical Examiner makes the ultimate determination if a death was, in fact, a homicide. Another area in which the Medical Examiner's contributions may not be fully appreciated is one of the most significant – as "family physicians to the bereaved" and providing closure to untold numbers of surviving family members.

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[4] CSI: Mississippi, A case study in expert testimony gone horribly wrong, http://www.reason.com/news/show/122458.html

[5] Reason's Reporting on Steven Hayne and Mississippi's Criminal Forensics System, http://www.reason.com/news/show/131242.html

[6] The Flexner Report and the Standardization of American Medical Education, http://jama.ama-assn.org/cgi/content/full/291/17/2139

7 Flexner Report...Birth Of Modern Medical Education, http://www.medicinenet.com/script/main/art.asp?articlekey=8795

Quality is a goal, not a destination; as such one of the hallmarks of any good lab is CQI – continuous quality improvement. NAME concurs with the NRC (see recommendation #2) that such quality is essential. As part of the NAME accreditation, an office has to have a quality assurance program. Benchmarks of that quality were demanded by the NRC report – certification and accreditation.

As physicians, Medical Examiners are well familiar with the necessities of personal qualification, to include licensure and medical specialty board certification. In 1933, American Board of Medical Specialties (ABMS) began medical specialty certification. Their motto says it all: "Higher standards. Better care."

- Nearly 85 percent of all licensed physicians in the United States are certified by at least one ABMS Member Board.
- Certification by an ABMS Member Board is widely recognized as the gold standard in assessing physician qualification. Healthcare institutions, insurers, physicians and patients use ABMS Member Board certification status as an essential tool to judge that a physician has the knowledge, experience and skills to provide quality healthcare within a given specialty. [8]

Pathologists have been certified in the subspecialty of Forensic Pathology by the ABMS for the past 50 yrs. NAME will only recognize a physician as a Forensic Pathologist if they are certified in Forensic Pathology by the ABMS. Of the full members of NAME, ~85% have their specialty boards and ~75% have their sub-specialty boards.[9]

Just as we believe individuals should have certain basic credentials, so too should lab systems. NAME pioneered the accreditation of medicolegal death investigation systems, commencing formally in 1975. It has accredited offices in cities all over the United States (such Atlanta, Miami, Los Angeles, and Houston); in state systems (New Mexico and Georgia), and other nations (Singapore). We do have a way to go yet, at present, only 49 Medical examiner Offices/systems are accredited with another 11 in progress.[10] Regardless, the recommendation that "All medical examiner offices should be accredited"[11] is a good one. In addition, targeting limited available funds (especially given the present budget constraints) is a good carrot to encourage compliance: "All federal funding should be restricted to accredited offices … or [those] that demonstrate significant and measurable progress in achieving accreditation within prescribed deadlines."[12]

Forensic pathologists are strong proponents of education and research. In addition to attaining basic qualifications, in order to maintain licensure physicians are required to undergo continuing education, attaining a specific number of hours of training annually (another general NRC recommendation). NAME holds two meetings each year and the AAFS one in order to provide the latest forensic medical advances to attendees from all medical specialties. The American Journal of Forensic Medicine and Pathology, the official publication of NAME is the oldest professional publication dedicated exclusively to the science of medicolegal death investigation.

[8] ABMS FACT SHEET, http://www.abms.org/News_and_Events/Media_Newsroom/pdf/ABMS_Fact_sheet.pdf
[9] R. Hanzlick & V. Weedn/National Association of Medical Examiners
[10] National Association of Medical Examiners
[11] STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD, THE NATIONAL ACADEMIES PRESS , Washington, D.C., February 2009
[12] Ibid

The AAFS' Journal of Forensic Sciences is a multidisciplinary which includes pathology/biology. These and other specialty journals present the latest advances in the field, however, sorely needed ongoing research has been difficult to fund. I am personally involved in studies in the field of child abuse and have to rely on the generosity of one of my community's non-profit hospitals to conduct tests that would otherwise go undone. The NRC call "…to support research, education, and training in forensic pathology…"[13] must be heeded if we are to keep pace with the ever advancing field of clinical medicine and other scientific disciplines. Only by making Forensic Pathology a continuously intellectually challenging discipline can we attract the best and brightest to the field in order to make that promise of a brighter future a reality. Guidance is needed, as indicated in the recommendation that a medicolegal death investigation Scientific Working Group (SWG) to "…develop and promote standards for best practices, administration, staffing, education, training, and continuing education for competent death scene investigation and postmortem examinations,"[14] to include new technologies. Directed group efforts have produced vital information to provide high quality death investigation at "every scene, every time."[15] Similarly, training curricula targeted to the most difficult of death scenes, those involving infants[16] have sought uniformity to the investigation of these tragic cases.

One of the more controversial among the NRC findings would be the conversion to a nation-wide Medical Examiner system, replacing the existing political office of coroner present in many jurisdictions. Professionalization death investigation has been proposed by the same National Academies – most recently in 2003 through the Institute of Medicine,[17] but also a little further back by the in 1928[18] and again in 1932.[19] Perhaps it isn't surprising to see that change is slow to come, after all what's 80 years against an elected office dating to the 900's and which made its comeback in 1194![20] Those who live in the past are destined to remain there. In that context, "the goal of replacing and eventually eliminating existing coroner systems"[21] can be seen as an attempt to improve a presently "adequately" functioning system. We must recognize that the mission of the medicolegal investigation of death has changed over the years. What used to be considered primarily a function of the justice system (be it criminal or civil) is now much, much more: "The role of medical examiners and coroners has evolved … to a broader involvement that now significantly benefits the public safety, medical, and public health communities. It is foreseeable that the public health role of medical examiners and coroners may continue to grow and that, perhaps in the not too distant future, public health impact will surpass criminal justice

[13] Ibid
[14] Ibid
[15] Death Investigation: A guide for the Scene Investigator, http://www.ncjrs.org/pdffiles/167568.pdf
[16] Sudden, unexplained Infant death Investigation Curriculum Guide, http://www.cdc.gov/SIDS/PDF/508SUIDIGuidelinesSingles.pdf
[17] National Research Council. Bulletin of the National Research Council, No. 64: The Coroner and the Medical Examiner. Washington DC: National Research Council;1928.
[18] Institute of Medicine. Medicolegal Death Investigation System: Workshop Summary. Washington DC: National Academy of Sciences; 2003.
[19] National Research Council. Bulletin of the National Research Council, No. 87: Possibilities and Need for Development of Legal Medicine in the United States. Washington DC: National Research Council; 1932.
[20] CROWNER: Origins of the Office of Coroner, Prof. Bernard Knight, CBE, http://www.britannia.com/history/coroner1.html
[21] STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD, THE NATIONAL ACADEMIES PRESS , Washington, D.C., February 2009

as the major focus of medicolegal death investigation in the United States." [22] We can do better, but in order to do so, we must first understand the issue.

Typically death investigation is handled at the state or usually local level. No two systems are the same, even though many are similar. Of the 3137 US counties, roughly 1/3 (960) are true Medical Examiner counties without Coroners. These fall into four basic models: true State Medical Examiner (19 states – 697 counties), pure County Medical Examiner (2 states – 98 counties), pure District (Regional) Medical Examiner (1 state – 67 counties), and sporadic (mixed) Medical Examiner (14 states – 98 counties).[23] One problem is terminology – for example some states use the term "medical examiner" but do not require that person to be a pathologist. In short, in norder to fix this one part of the overall "forensic system," significant restructuring of operations and local, state, and federal laws would be required.

In common usage, the terms Medical Examiner and Coroner are used interchangeably by many. In reality, there is a world of difference. A Medical Examiner in the purest sense is a physician, who after completing medical school continues training four or five more years in the field of General (also known as "Hospital") Pathology. Following that, are one to two years of specialized subject matter training in Forensic pathology. Following that are an intensive three day written and practical board examination in General Pathology followed by a one-day exam in Forensic Pathology. Compare that with the basic qualifications of the coroner, which are election to the office, often without any medical background or training at all. Their medical education is either on-the-job or yearly seminars on selected topics. I ask you – should the unfortunate instance arise, whom would you prefer perform this most important medicolegal examination on your loved one and then to testify about it in court? Who should be in charge of that death investigation system? With all due respect and with no offense intended, I do not believe a cab driver should be directing brain surgery. NAME agrees with the NRC that that "All medicolegal autopsies should be performed or supervised by a board certified forensic pathologist."[24] As of now, there are approximately 245 titular or de facto chief medical examiners in the U.S. In reality, only ~160 of those meet NAME's definition of a Forensic Pathologist.[25] There are only ~400 active, full-time practicing Forensic Pathologists in the US.[26] In 2008 at the 126 Medical schools in the US and 8,589 Medical Training Programs (representing 141 specialties) and 18,372 new medical students, only 37 new physicians entered the field of Forensic Pathology .[27]

Personally, I have worked with some excellent coroners who were dedicated and diligent. I suggest we not throw the baby out with the bath water. It is obvious that there insufficient

[22] Medical examiners, coroners, & public health: a review & update, Arch Path Lab Med. 2006 Sep;130(9):1274-82
[23] R. Hanzlick & V. Weedn/National Association of Medical Examiners
[24] STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD, THE NATIONAL ACADEMIES PRESS , Washington, D.C., February 2009
[25] R. Hanzlick & V. Weedn/National Association of Medical Examiners
[26] Ibid
[27] R. Hanzlick, AAFS Pathology/Biology Annual Luncheon, from JAMA, September 10, 2008

Medical Examiners now and for the near-term future to simply flip a switch off on the Coroner system. Working with appropriate stakeholders, I would propose we roll the present functions of the traditional County Coroner into those of the Medical Examiner's office and utilize these already functioning professionals as lay investigators within that Medical Examiner system. This has the advantage of reduced costs and more rapid implementation. Obviously, those directly involved would have to have buy-in.

In order to achieve the goal of timely delivery of the highest quality forensic service to our citizens, we must have sufficient resources to make sure it happens. We must increase the numbers of trained Forensic Pathologists (and all other forensic practitioners) and strive for uniformity in the process of death investigation. Estimates indicate that twice the existing number of Forensic Pathologists would be needed to fully staff a true Medical Examiner system across the entire country. The NRC indicated that "Congress should appropriate resources to …support research, education, and training in forensic pathology."[28] If we want more people in the field, we need to recruit them early and retain them. Toward that end, the report made a bold proposal, that "….medical student loan forgiveness and/or fellowship support, should be made available to pathology residents who choose forensic pathology as their specialty."[29] As someone over twenty one years out of medical school and with my oldest child graduating college and my second starting, I am proud to report that they have no outstanding student loans – but that their father could say the same!

In addition to the staffing issues, conversion to a nationwide Medical Examiner system will be expensive, as will be implementation of all the "forensics system" improvements called for by the NRC. "Funds are needed to build regional medical examiner offices, secure necessary equipment, improve administration, and ensure the education, training, and staffing of medical examiner offices. Funding could also be used to help current medical examiner systems modernize their facilities to meet current Centers for Disease Control and Prevention-recommended autopsy safety requirements."[30] As the panel's charge did not include budgetary issues, the inconvenient "how to pay for it" was left out of the mix.

Independence is also an important consideration. As my regular job falls under the umbrella of a law enforcement agency (the Georgia Bureau of Investigation), some might see that I have a pro-police bias. In reality, as I have testified from the stand many times before, I am neither pro-prosecution nor pro-defense; I am pro-truth. Within my agency, we are operationally independent, as it should be. I have worked in four different models of death investigation administration: private contractor, university employee, independent state agency, and law enforcement agency. I have found the best support I have ever had in the latter system. That those within law enforcement (as in the courts) would be interested in the results of my examinations is hardly surprising. Truth be told, I have never dealt with any law enforcement officer who wanted me to force a call or modify an opinion to suit some clandestine purpose. Quite the contrary, my experience has been that those police agencies who rely on my reports to

[28] Ibid
[29] STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD, THE NATIONAL ACADEMIES PRESS , Washington, D.C., February 2009
[30] Ibid

determine if a case should be further scrutinized are understaffed and underfunded and are looking for guidance into how to best manage their own scarce investigative resources.

As for the science, an important distinction should be made between conventional science and forensic science. Ultimately, in the latter case the data must be available for courtroom presentation. As such, what might be considered intra-disciplinary differences of opinion in the interpretation of test results take on a whole new light. The objective forensic observer must not only perform the testing neutrally but must also report it likewise. Australia has already established (and revised 5 times) Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia.[31] The intent is to make the expert an impartial finder of scientific fact and to impartially report those findings and their resultant opinions to the court. I believe that impartiality and fairness are essential, test results should be just that – good or bad for whichever side, they should be solidly based and then should be admitted as a matter of course in accordance with procedures. I remember the day when DNA evidence was challenged almost incessantly and now a case is almost deemed questionable if there isn't DNA evidence. The good folks at the Innocence Project have show first-hand how valuable good forensic evidence can be – for either side in our adversarial legal system.

The NRC was wise in recognizing that none of their goals, however well-intentioned, can come about overnight. We have serious jurisdictional and legal challenges to overcome. "This requirement should take effect within a timeframe to be established…, following consultation with governing state institutions."[32] It might be tempting to find a quick fix to the issue of oversight for the forensic sciences by placing it under existing entity. I do not believe that is in the spirit of what the NAS report called for:

> "The forensic science system, encompassing both research and practice, has serious problems that can only be addressed by a national commitment to overhaul the current structure that supports the forensic science community in this country. This can only be done with effective leadership at the highest levels of both federal and state governments, pursuant to national standards, and with a significant infusion of federal funds….What is needed to support and oversee the forensic science community is a new, strong, and independent entity that could take on the tasks that would be assigned to it in a manner that is as objective and free of bias as possible—one with no ties to the past and with the authority and resources to implement a fresh agenda."[33]

I do not think it in our best interests to try to "add on" to an existing structure, with its own extant biases and entrenched operational protocols. Such an institutionalized mindset would not seem to provide us the optimal chance to create a better way. The NRC report called for a new, independent entity for a reason – past experience. We have an opportunity to learn from past mistakes and to emulate our successes as we move forward. If we are to take home the messages of this NAS report, we should not cherry pick what we want to hear and disregard the parts we think we might do better without. This is one of those rare times in life where we have the

[31] http://www.fedcourt.gov.au/how/prac_direction.html
[32] Ibid
[33] STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD, THE NATIONAL ACADEMIES PRESS , Washington, D.C., February 2009

opportunity to get it right from the start as we follow a new, better path armed with the experiences that will ensure our best chances for success.

As for an independent model, there exists an independent National Institute of Forensic Science (NIFS)[34] in Australia. The NIFS core functions include:[35]

- Sponsor and support research in forensic science;
- Advise on and assist with the development and co-ordination of forensic science services;
- Gather and exchange forensic information;
- Support, co-ordinate and conduct training programs in forensic science; and
- Conduct relevant quality assurance programs.

Additional present and future activities of NIFS include:[36]

- Raising the profile of forensic science; and
- Constructive and accountable resource management.

Created in 1991 as a National Common Police Service, the agency governance includes a Board of Control (comprised of three Police Commissioners, three Forensic Laboratory Directors, and a distinguished University Provost) and a Panel of Advisors (scientists, police, legal practitioners, and medical practitioners). The multidisciplinary nature of their directorate should not be missed, particularly the law enforcement and legal communities shoulder-to-shoulder with the scientific and medical; "…diversity makes for a rich tapestry, and we must understand that all the threads of the tapestry are equal in value no matter what their color."[37] I am not well-acquainted with the existing NIFS but it certainly does sound as though it addresses many of the issues brought up in the NRC report. I suggest we might well benefit from more detailed analysis of this existing model as we venture to build our better mouse trap.

As for the National Institute of Science and Technology (NIST) specifically, I feel that there are their continued efforts to improve forensics will remain beneficial. In fact, the NRC report calls for their involvement in setting accreditation and certification standards.[38] While NIST clearly has a demonstrated record of unsurpassed technical in many scientific areas, it lacks an established history with regard to the complexities and intricacies of the interaction of of law enforcement, legal, and governmental issues so vital to operations within the forensics environment. The day-to-day application of forensics means working with less than optimal evidence and trying to obtain the best possible result, then repoting that to the appropriate entities. The NIST expertise in laboratory standards does not translate well into the larger issues of accreditation & certification implementation, practitioner professionalism and ethics, or administrative areas. Nor, quite honestly, is there likely to be an easy buy-in from the forensics system as a whole given the shortcomings enumerated.

I look forward to working with all those with a sincere interest in providing timely delivery of the highest quality forensic science services to all. With continued effort, the NAS report is a significant step in that direction. In closing, I believe that the Path Forward for forensic sciences,

[34] http://www.nifs.com.au/
[35] http://www.nifs.com.au/NIFS/NIFS_frame.html?about.asp&1
[36] Ibid
[37] Maya Angelou
[38] STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD, THE NATIONAL ACADEMIES PRESS , Washington, D.C., February 2009

as outlined in the national Academy of Sciences report is best served by that old adage, “good enough seldom is.” The American people deserve better.