Forensic Science in the 21st Century: A Role for Proficiency Testing

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Goals of Forensic Science

- To reliably examine & interpret physical clues
  - Identification
  - Reconstruction
  - Individualization
- Crime Labs - 80% are units of law enforcement
- Examiners are ethically bound to examine evidence objectively and to report their findings
- Rapid expansion of labs (4X) since 1968
- Labs chronically under funded, plagued by backlogs, and unregulated before 1980

Very Slow Growth of Standards

- Police/courts oversaw methods & expertise
- Labs resisted standards (‘every case is unique doctrine’)
- LEAA proficiency testing study - mid 1970s
- ASCLD accreditation (1982)
- Criminalistics certification began in (1990)
- NBS/NIST standards have had little impact
- Profession remained fiercely independent

LEAA Proficiency Testing Results 1978

- Major problems revealed in many areas
- DOJ/LEAA funding support terminated
- Profession insisted on anonymity
- Test samples declared (not blind)
- Very limited dissemination of results
- Samples/scenarios lacked sophistication, realism, and detailed interpretation

Impact of DNA Testing/Daubert on Standards and Proficiency Testing

- NRC DNA Studies in 1992 and 1996
- TWGDAM Standards - 1988
- DNA Advisory Board and CODIS (1998)
- TWG and SWG Methods Advisory Groups
- Mandated standards/proficiency testing for DNA, but not for other areas of evidence testing
- Daubert introduced review of hypothesis testing, detailed methods, error rates, and standards

NRC 2009 Report and Proficiency Testing

- Rec 5 - Research on sources of human observer bias and measurement error
- Rec 6 - Protocols, standards and proficiency testing should be advanced
- Rec 7 - Mandatory accreditation and certification with proficiency testing
- Rec 8 - Routine quality assurance and quality control procedures

Crime Lab Proficiency Test Results (CTS) 2000-2005*

Evidence Category	Correct	Incorrect	Inconclusive
Biol Fluids (N = 36,000)	99.4%	0.1%	0.5%
Latent Prints (N = 31,000)	98.5%	0.4% Type I	1.1% Type II
Fibers (N = 2,222)	99%	0.8%	0.2%
Drugs** (N = 5,777)	97%	0.6%	0.8%

Crime Lab Proficiency Test Results (CTS) 2000-2005

Evidence Category	Correct	Incorrect	Inconclusive
Glass (N = 1,376)	96%	1.7%	2.0%
Handwriting (N = 6,562)	92%	0.7%	7.1%
Firearms (N = 5,963)	89%	0.7%	10.3%
Toolmarks (N = 4,533)	77%	1.3%	21.9%

Crime Lab Proficiency Test Results (CTS) 2000-2005

Evidence Category	Correct	Incorrect	Inconclusive
Paint (N = 2,392)	95%	3.6%	1.5%
Arson* (N = 1,824)	89%	9%*	2%

Proficiency Testing is Critical but Must be Improved and be Made Mandatory

- Accepted by field, but NIJ and other entities have failed to provide guidance and resources
- Results posted (CTS) but remain anonymous
- Test samples not always realistic, innovative, and do not address legal/contextual problems
- Proficiency testing not mandatory (except for accreditation) and laboratories not identified
- Blind testing & random reanalysis not adequately evaluated

Mandatory Proficiency Testing is Needed Now

- Tremendous amount of fundamental forensic research needed
- Basic research may take years, but what is to be done in the short term?
- Immediate need to improve, expand and mandate proficiency testing for forensic experts
- Error rates can provide important indicators to courts if a method should be admitted
- PT can address scientific and bias questions