Unreliable or Improper Forensic Science

Since the late 1980s, DNA analysis has helped identify the guilty and exonerate the innocent nationwide. While DNA testing was developed through extensive scientific research at top academic centers, many other forensic techniques — such as hair microscopy, bite mark comparisons, firearm tool mark analysis and shoe print comparisons — have never been subjected to rigorous scientific evaluation. Meanwhile, forensics techniques that have been properly validated — such as serology, commonly known as blood typing — are sometimes improperly conducted or inaccurately conveyed in trial testimony. In some cases, forensic analysts have fabricated results or engaged in other misconduct.

All of these problems constitute unvalidated or improper forensic science, which is the second-greatest contributor to wrongful convictions that have been overturned with DNA testing.  In 49% of DNA exonerations, unvalidated or improper forensic science contributed to the wrongful conviction.

While DNA exonerations are a window into the effect of unvalidated or improper forensic science contributing to wrongful convictions, DNA does not solve the problem. In fact, experts estimate that only 5-10% of all criminal cases involve biological evidence that could be subjected to DNA testing. In the other 90-95% of crimes, DNA testing is not an option – so the criminal justice system relies on other kinds of evidence, including forensic disciplines that may not be scientifically sound or properly conducted.

**The Absence of Scientific Standards**

Unlike DNA testing, many forensic disciplines – particularly those that deal with comparing impression marks and objects like hair and fiber – were developed solely to solve crime.  These disciplines have evolved primarily through their use in individual cases. Without the benefit of basic research or adequate financial resources, applied research has also been minimal.

In fact, many forensic testing methods have been applied with little or no scientific validation and with inadequate assessments of their robustness or reliability. Furthermore, they lacked scientifically acceptable standards for quality assurance and quality control before their implementation in cases.

As a result, forensic analysts sometimes testify in cases without a proper scientific basis for their findings. Testimony about more dubious forensic disciplines, such as efforts to match a defendant’s teeth to marks on a victim or attempts to compare a defendant’s voice to a voicemail recording, are cloaked in science but lack even the most basic scientific standards.  Even within forensic disciplines that are more firmly grounded in science, evidence is often made to sound more precise than it should.  For example, analysts will testify that hairs from a crime scene “match” or “are consistent with” defendants’ hair – but because scientific research on validity and reliability of hair analysis is lacking, they have no way of knowing how rare these similarities are, so there is no way to know how meaningful this evidence is.

**Improper Forensic Testimony**

Too often, forensic analysts’ testimony goes further than the science allows. Many forensic techniques that have been practiced for years – but not subjected to the rigors of scientific research – are accepted and repeated as fact. Juries are left with the impression that the evidence is more scientific than it is, and the potential for wrongful convictions increases.

Improper forensic testimony is not limited to unvalidated disciplines, however. Among the DNA exoneration cases, scores of people were wrongfully convicted after forensic testimony misrepresented serology results. Serology is still used, but before DNA testing it was the only way to help identify the source of blood, semen or other bodily fluids at a crime scene. Using serology, forensic analysts could determine what blood type was present in fluids collected in a rape kit, for example. In many cases, analysts testify properly about what the serology can tell and what percentage of the population shares the perpetrator’s blood type. But in other cases, analysts fail to recognize that the biological sample could be a mixture of fluids from the victim and perpetrator, and the victim’s blood type could mask the perpetrator’s – making it impossible to know the blood type of the perpetrator. In other cases, analysts provide inaccurate statistics for the percentage of the population who share the perpetrator’s blood type.

**Forensic Misconduct**

The vast majority of forensic employees are hardworking, ethical and responsible. They use the best scientific techniques available to deliver objective, solid information – regardless of whether the science favors the defendant, supports the prosecution or is inconclusive.

In many cases, the science – rather than the scientist – is inadequate. In other cases, forensic analysts make mistakes that could result from lack of training, poor support or insufficient resources to meet an ever-growing demand. But in some cases, forensic analysts have engaged in misconduct. While these “bad apples” don’t reflect the entire forensic field, one fraudulent forensic analyst can taint countless cases. For example, in some wrongful convictions later overturned with DNA testing, forensic analysts fabricated test results, reported results when no tests were conducted or concealed parts of test results that were favorable to defendants. In virtually all of these cases, analysts had engaged in misconduct that led to multiple separate wrongful convictions, sometimes in multiple states.