S01 To See or Not to See: Unbiased Answers to Forensic Questions

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Learning Overview: After attending this presentation, attendees will have a greater understanding of the role of human bias in forensic sciences, the risks and benefits of information, targeted versus non-targeted methods, decoupling data analysis and comparison, the standardization of methods, and a greater appreciation for the complexity of balancing contextual information and decision points in forensic science disciplines and its impact in the justice court system.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by offering the various perspectives regarding the role of human bias in forensic sciences and the pursuit of truth and justice.

Forensic science can be a powerful force for truth and justice, but a dangerous instrument to subvert truth and justice when performed with bias. Forensic scientists strive to be neutral and objective and take steps to address bias. From television dramatizations, the public may have the wrong impression of how we do our jobs. Nonetheless, it is important that the public trusts the forensic science community. We need to be seen as neutral and objective, and, in fact, be neutral and objective. Forensic science disciplines vary in their susceptibility to bias. The most accusatory of the forensic sciences, fingerprint and DNA evidence, involve objectively searching electronic databases without a specific suspicion of a given individual. With further automation, the forensic science community will become further freed from bias and an ever-greater force for truth and justice.

This workshop will explore the human bias in targeted and non-targeted approaches in forensic science. This workshop will discuss decoupling data analysis and comparisons and the measuring of forensic identification information, with a special look at a DNA case example to evaluate the impact of targeted versus non-targeted methods on justice.

Medical examiners have statutory duties to determine cause and manner of death and must obtain multiple sources of information that may be hearsay in a criminal trial. This process can limit targeted investigations, as the medical examiner has a statutory duty to investigate some deaths and not others. An autopsy and its findings cannot be viewed in isolation of other information to get the correct cause and manner of death. Forensic pathologists may have information withheld that biases or limits their opinion. This can result in disagreements between the forensic pathologist, who typically will present the evidence in a court of law, and those who are certifying cause and manner of death.

There are multiple sources of bias, such as analytical bias, test selection bias, result interpretation bias, and case interpretation bias. Analytical bias can be easily managed by employing validated methods and reporting uncertainty of measurement where appropriate. However, there will be instances in which the expert has to exercise their discretion based on their expertise. Those decisions should be made objectively based on data. Contextual information guides test selection, which may be prone to bias. Toxicological data, for example, cannot be interpreted in a vacuum, case information is always required to evaluate the role of substances in a case. Since contextual information is required to appropriately interpret toxicology findings, it is essential that the scientific basis for opinions and conclusions always be provided.

By Rules of Evidence and the interpretive case law dealing with scientific and technical expertise, the judicial system controls whether expert opinion can be admitted as evidence in cases and how such evidence is judged to be adequate for purpose. Despite the *Daubert* decision in 1993 that purported to judge scientific evidence by the scientific method, older methods of attributing validity to expertise, such as legal precedent and "common sense," often create inconsistent and unpredictable results.[1] These are forms of bias in need of correction. *Daubert* specifically drew attention to the need for applied standards in scientific evidence. The judicial system has regarded confrontation, cross-examination, and discovery as the "crucibles of truth" by which scientific truth can be discerned. Increased attention is being given to the development of standards-based assessments of validity, reliability, and the effects of biases of many sorts on the quality of evidence that should be trusted in cases at law. As the judicial system refines its standards for determining the proper way of determining adequate justification for assertions of truth based on science or other knowledge-based expertise, forensic science also seeks to refine its warrant of believability through standardized methodologies based on validated and demonstrably reliable standards of practice and conduct.

The importance of the implementation of standardized methods of analysis in pursuit of justice and truth in evidence will be discussed. This presentation will cover the steps necessary for the development and implementation of standards, including the incorporation of inter-laboratory exercises in the development of documentary standards. In addition, a summary of new developments and the current state of standardization of practice within the forensic chemistry disciplines will be presented.

Reference(s):

1. *Daubert v. Merrell Dow Pharmaceuticals.* United States Supreme Court 509.U.S.579,113S.Ct.2786, 125L. Ed.2d 469. 1993.

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