

K62 The Benefits and Challenges of Implementing Blind Proficiency Testing in Blood Alcohol Analysis

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After attending this presentation, attendees will better understand the advantages and challenges of implementing a blind proficiency program in blood alcohol analysis.

This presentation will impact the forensic science community by illustrating the benefits of blind testing, subsequently raising the bar for proficiency test requirements. Attendees will learn the value of evaluating an entire quality management system and discover targets that can be assessed through blind testing.

Accrediting bodies require laboratories to participate in a minimum of one proficiency test annually in each area listed on the scope of accreditation. In the forensic community, annual proficiency testing is a tool laboratories use to evaluate the performance and competency of staff, test their quality systems, including evidence handling, instrumentation, standard operating procedures, and to review their case review process. The most common type of proficiency test is one purchased from a commercial vendor. In this type of “open” test, the test taker is aware he/she is participating in a proficiency test and the vendor knows how the test was made.

A limitation of such commercially made tests is they do not mimic actual casework and are often predictable. Furthermore, when an analyst knows they are taking a test, they tend to be more cautious, which can create bias. While the external proficiency exams are a valuable tool in ensuring the quality of test results through inter-laboratory comparisons, the Houston Forensic Science Center (HFSC) sought to use blind samples to objectively test its overall quality system.

As a measure of continuous quality improvement, HFSC implemented a blind proficiency testing program in blood alcohol analysis in September 2015. HFSC purchased blood alcohol material prepared to its requested specifications. The material consisted of human blood in gray-top blood vials filled by puncture and spiked with ethanol in a range of concentrations. The case submission forms used fabricated subject information and the samples were packaged in the same blood alcohol collection kit used by HFSC’s clients. The cases were then tagged at the client’s property room and submitted to the laboratory to mimic a typical chain of custody and true casework. The proficiency test samples then flowed through the process unrecognized by the participating analyst and back to the client. The greatest challenge in this project was keeping the cases blind. HFSC discovered that even the smallest deviations from normal casework would raise red flags for the analysts and create suspicion. Still, as the cases flowed through the system incognito, analysts did not know if they were analyzing a real case or participating in a blind test.

The completed tests were compared to the expected concentration and control charts plotted standard deviation. These control charts allowed the data to be searched for deficiencies. Additional targets evaluated included training gap assessment, precision of instrumentation, and general stressors on the system.



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The blind proficiency program has been highly successful and has proven to be a true test of the entire quality management system. Feedback from participating analysts and clients has been overwhelmingly positive. Data compiled from the blind proficiency program has shown that the methodologies used by the section and the quality system are capable of obtaining accurate and reliable results. Furthermore, satisfactory results obtained by participating analysts provides them with added confidence in court as they are able to discuss an additional quality control measure that attests to the reliability of the results.

Blind Proficiency Test, Quality Control, Alcohol Analysis