adult male and 9 year-old male child were found in the driveway. Autopsy findings on the child indicated sharp force injuries of the intestines, the mesentery, and the spleen. In addition to blunt force injury, the adult exhibited a sharp force injury of the right external jugular vein. Based on the case histories and autopsy results, the cases were ruled homicide and suicide, respectively.

Disclosure: All authors have declared no conflicts of interest.

REVIEW OF IN-CUSTODY DEATHS IN MISSISSIPPI

Mark Levaughn, Lisa Funte, J. B. Davis, Anastasia Holobinko, Steven A. Symes
State Medical Examiner's Office, Pearl/MS/UNITED STATES OF AMERICA

The goal of this presentation is to review the history and structure of the prison system in the State of Mississippi and to present various cases in which inmates have died while in custody. This presentation will impact the forensic community by demonstrating the challenges in determining the cause and manner of deaths occurring in custody. The first reported prison to be developed in Mississippi was in 1789 in the city of Natchez. The first centralized prison was not established until April 1840, and was designed to house 200 inmates. Overcrowding soon became an issue. Subsequently, the Governor released 40 inmates in order to increase the manpower of the Confederate Army. The prison was eventually overrun by Sherman's army on his march to Atlanta. The current State Penitentiary in Parchman, Mississippi was built in 1901. A federal mandate in 1972 ordered the state to develop a plan to address issues that included racial segregation, possession of weapons, drugs and alcohol, and the punishment of inmates. The Mississippi Department of Corrections (MDOC) was established in July 1976. Under their jurisdiction there are three state-run prisons, eleven regional prisons, six private prisons and four restitution centers. In addition, each of the 82 counties has at least one county jail. The MDOC houses approximately 21,000 inmates, 47 of whom are currently on death row. The MDOC inmate population figure is the second highest in the nation. The investigation of in-custody deaths is a multidisciplinary team effort and presents challenges at all levels. Although recent data was unavailable at the time of this submission, a total of 71 in-custody deaths were reported in 2014. This presentation will provide photographic and video documentation of scene and autopsy evidence which illustrates the variability exhibited by in-custody deaths falling under the jurisdiction of the Mississippi State Medical Examiner's Office.

Disclosure: All authors have declared no conflicts of interest.

PERFORMANCE CHARACTERISTICS OF THE INTOXILYZER 9000 - AN INDEPENDENT ASSESSMENT AND REVIEW

Jan Semenoff
Counterpoint Journal, Industrial Training & Design Ltd, Saskatoon/CANADA

Evidential breath alcohol testing (EBT) instruments are typically evaluated to determine their accuracy, precision, specificity towards ethanol detection and overall reliability by government agencies and state run or sponsored forensic crime labs. Independent testing and analysis by individuals in private practice is rare, due in part to controlled access to EBT instrumentation. The author had an opportunity to conduct an independent inspection of an Intoxilyzer Model 9000, recently introduced by CMI Inc. as the most advanced EBT in their product line and now in use in a few jurisdictions in the United States. A review of the report prepared by the Georgia Bureau of Investigation will be presented, and compared to the independent inspection conducted. The instrument was assessed in its performance in the following areas: Specificity towards the detection of ethanol in combination with interfering volatile organic compounds (VOCs) including acetone, isopropanol, methanol and d-limonene; Susceptibility towards radio frequency interference (RFI); The ability of the instrument to identify the presence of oral pathway contamination by the residual alcohol detection algorithm, and; The ability of the instrument to report accurate of precise breath-alcohol concentrations (BrAC) in testing the vapors of simulation solutions having a known ethyl alcohol concentration. The findings support the notion that the Intoxilyzer 9000 can reliably detect the presence of VOCs and report that the breath sample is contaminated by a substance other than ethanol, although the preliminary electronic display on the instrument often indicated a substantially higher reported BAC that was subsequently not reported on the printed results. There is a concern that a breath test operator may misinterpret the preliminary display results and attempt to report them to the courts as an accurate representation of the BAC of the test subject. The RFI detect process was observed to generate both false-negative and false-positive results without indicating the presence of the RFI. The findings also support the notion that the residual alcohol detection system does not reliably detect the presence of mouth-alcohol contamination, thereby reinforcing the necessity of correctly performing a deprivation and observation period of at least 15-20 minutes prior to receiving breath samples suitable for analysis. The author will present the results of this independent testing along with photographs and videos of the instrument. Recommendations will be made for breath-testing procedures that will minimize the impact of identified concerns on an evidential breath-alcohol test.

Disclosure: All authors have declared no conflicts of interest.

RELIABILITY OF HEMASTIX® VS. KASTLE-MEYER/PHENOLPHTHALEIN TEST AND ASSOCIATED FALSE-POSITIVE RATES

Matthew Woo[1], Rob Felske[2]
[1]*Forensic Science, University of Toronto at Mississauga, Mississauga/ON/CANADA,* [2]*Forensic Identification Services, Halton Regional Police Service, Oakville/ON/CANADA*

The purpose of this study was to test the reliability, in terms of specificity, of the Hemastix® vs. Kastle-Meyer/Phenolphthalein test (3-step) detection abilities for the presence of blood by studying their associated false-positive rates in order to determine the most suitable test for use at crime scenes. This study was conducted by testing 7 different categories of materials, each comprising between 3 and 12 items. The categories tested included plants/fruits/vegetables, manufactured items, animal, metal compound solutions, chemical solutions, household chemicals and household products. A total of 55 items were tested, each sampled 4 times with each of the two presumptive tests. The Wilcoxon Signed-Rank Test results demonstrate that there is a significant difference between the Hemastix® and Kastle-Meyer tests overall, taking all categories into account. Specifically, testing with Hemastix® produced more false-positives for the plants/fruits/vegetables and metal compound solutions categories, whereas there were no significant differences between the two tests for: manufactured items, household chemicals and household products. It should be noted that the animal and chemical solutions categories also displayed no significant differences between the two tests (statistically significant but not practically). Based on the results of this study and taking into account other factors such as accessibility, efficiency, cost and sensitivity, the recommended presumptive blood test for use at crime scenes for reliability in terms of specificity is the Kastle-Meyer (3-step) test. This research will provide valuable information for investigators and forensic identification officers in their assessment and consideration of which method to use at crime scenes. It will also assist the Bloodstain Pattern Analysis Scientific Area Subcommittee (OSAC) and International Association of Bloodstain Pattern Analysts (IABPA) in potentially revising their protocols and guidelines for the detection of bloodstains as well as aid expert witnesses in explaining why one method was chosen over the other.

Disclosure: All authors have declared no conflicts of interest.