G132 Increasing Efficiency in the Autopsy Suite: Rapid Drug Screening on Pericardial Fluid

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After attending this presentation, attendees will understand usage of pericardial fluid for toxicology testing, and how to increase efficiency in the autopsy suite by utilizing rapid drug screens.

This presentation will impact the forensic science community by increasing efficiency during autopsies, reducing unnecessary laboratory work, and showing other offices how to reduce costs while maintaining high quality forensic work.

Suspected illegal and prescription drug abuse compose a large subset of autopsies that are performed. However, there are also many cases in which the death can be attributed to a natural cause, if drug abuse can be eliminated as contributing factor. In order to reduce the amount of toxicology work to be done by the laboratory, the medical examiners employ rapid urine testing at the time of autopsy in such cases. The TLC based test gives qualitative results for presence or absence of amphetamine, methamphetamine, cocaine, and PCP, the four most common illegal drugs associated with sudden death. If no drugs are detected, a cause and manner can sometimes be assigned at the end of the autopsy, expediting closure for the family. However, many of these cases yield toxicology laboratory work anyway, due to the lack of urine or unsuitable samples of urine in the body.

Several bodily fluids are available at autopsy. There is no doubt that fluid specimens are much more convenient to be handled for drug and chemical analyses than solid tissue specimens. The qualitative usefulness of urine and bile for analysis of drugs is well known, but there is little information on the usefulness of pericardial fluid in spite of usually sufficient amounts available at autopsy. Pericardial fluid is an ultra-filtrate similar to urine. Many of the substances that are detected qualitatively in urine are also detectable in pericardial fluid. By utilizing the same TLC based assay that is originally designed for rapid urine drug testing, 59 cases at the office were evaluated simultaneously via quick pericardial fluid testing, quick urine testing, and normal toxicology assays on routine toxicology specimens (routine toxicology assays include HPLC, gas chromatography, mass spectrometry and combinations thereof). Of the 59 cases, four were homicides, 15 were accidents, 10 were suicides, and 30 were classified as naturals. No decedents under the age of 12 were included, nor were cases in which urine or pericardial fluid was not present for testing.

The results of the quick toxicology tests were photographed and evaluated, and then compared to the final toxicology results. The sensitivity and specificity of the quick urine screen was 100% and 73%, and for the quick pericardial screen was 95% and 84%, respectively.

By utilizing pericardial fluid as a substitute for when urine is not available for rapid drug screening at the autopsy table, excess laboratory work can be eliminated, as well as expediting issuing of a cause and manner of death. This has a has a three-fold effect of lowering laboratory costs, decreasing death certificate turnaround time, and also allows for families and loved ones to reach closure sooner. Further research includes expanding the pericardial drug screen from illicit stimulants to include major prescription drugs of abuse (i.e., – opiates, benzodiazepines, etc.).

Pericardial Fluid, Drug Screening, Efficiency

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