## B72 Analysis of Seized Hypodermic Syringes for Drug Content

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After attending this presentation, attendees will have a better understanding of the results of analysis for controlled substances of 469 syringes seized by law enforcement and submitted to the Bucks County Crime Laboratory.

This presentation will impact the forensic science community by providing the results of one laboratory's experience of analyzing syringe residues for controlled substances by Gas Chromatography/Mass Spectrometry (GC/MS).

Drug paraphernalia is commonly submitted to forensic science laboratories for analysis of controlled substances. Paraphernalia seized by law enforcement often includes used syringes from drug abusers. The syringes are usually submitted to the laboratory with the needle intact. The proper submission of syringes should include a protective container labeled as a biohazard to protect anyone who must handle the evidence. Laboratories should have procedures in place to safely handle this type of evidence. It is a known fact that the sharing of syringes by intravenous drug abusers is a primary cause of the transmission of HIV and hepatitis B and C. Anyone who handles this type of evidence, particularly forensic chemists and law enforcement, is at risk of acquiring these diseases. For this reason, many laboratories choose not to analyze this type of evidence unless absolutely necessary.

However, there are a number of important reasons to analyze syringes submitted to crime laboratories. Laboratories may chose to have syringes analyzed because: (1) it is the only item in the case; (2) it may be the probable cause for arrest; (3) it may be essential for determining the cause of death in a death investigation; (4) possession of the contents of the syringe may be a significantly more serious offense than possession of other items in the case (e.g., a syringe with heroin vs. a bag of marijuana); or, (5) for other reasons specific to the case.

This presentation will report the results of analysis for controlled substances of 469 syringes seized by law enforcement and submitted to the Bucks County Crime Laboratory during the period of January 2014 through July 2015. The syringes were extracted with methanol. The methanol extract was evaporated, then reconstituted with five drops of methanol and divided into two vials, which were analyzed by GC/MS on separate instruments with different conditions. One-microliter injections of the methanol extracts were analyzed by GC/MS on an Agilent® 7890B gas chromatograph equipped with a 7693 autosampler interfaced to a 5977A mass selective detector. The column used was a 30m x 0.25mm x 0.25µm HP-5MS. The inlet temperature was 290ºC, the transfer line temperature was 250ºC, and the source temperature was 230ºC. One-microliter injections of the second aliquot were analyzed on a Perkin® Elmer® gas chromatograph model Clarus® 500 interfaced to a Clarus® 500S Perkin® Elmer® mass spectrometer. The column used was a 15m x 0.25mm x 0.25µm ELITE-5MS. Helium was used as the carrier gas for both columns with a flow of 1.0mL/min and linear gas velocity set at 38cm/sec. The inlet temperature was 290ºC, the transfer line temperature was 270ºC, and the source temperature was 250ºC. The mass scan range was set at 40m/z-500m/z for all samples. The column temperature program was optimized on both columns to ensure baseline resolution of heroin and 6-monoacetylmorphine (6-MAM). The initial column temperature was 130ºC with a hold time of 2.0 minutes, then the oven temperature was increased at 15ºC/min to 250ºC without a hold time and increased again at 15ºC/min to 320ºC with a final hold time of 3.0 minutes. The samples were run in split mode and with a 50:1 split ratio.

Of the 469 syringes analyzed, 71% were positive and 62% of the 294 cases analyzed were positive. The most common drug identified was heroin (46%). Other drugs identified were morphine (11%), cocaine (5%), methamphetamine (3%), fentanyl (1%), oxycodone (1%), and buprenorphine (1%) as well as various cutting agents, heroin metabolites and naturally occurring opiate alkaloids. Caffeine (16%) was the most common non-controlled substance detected.

**Controlled Substances, Syringes, GC/MS**





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