TOXICOLOGY LABORATORY REVIEW

Forensic toxicology provides a comprehensive drug testing service in medico-legal death investigation. The laboratory offers routine testing for alcohol and simple volatile compounds, drugs of abuse (cocaine, amphetamines, opioids, benzodiazepines, fentanyl and cannabinoids), as well as many therapeutic agents and poisons. This cases work translates into about 30,000 tests annually. Currently the laboratory is staffed by a laboratory manager, five toxicologists and a laboratory assistant.

2010 was the first year of operations in our new facility. The new laboratory together with the new instrumentation resulted in the need for some new approaches and new methodologies for our work in the forensic toxicology laboratory. Such developments will continue for the next several years.

MAJOR ACHIEVEMENTS

A mid-cycle review resulted in continued accreditation by the American Board of Forensic Toxicology (ABFT). The laboratory has now been fully accredited since 2005.

The introduction of new services for the routine biochemical testing for vitreous chemistries and electrolytes (glucose, urea, creatinine, sodium, chloride and potassium) was an immediate bonus for the laboratory. On average about 10-15 cases are now screened on a weekly basis for markers of untreated diabetes and electrolyte imbalances. These services were previously sent out to reference laboratories which were an added expense to the laboratory's already stretched budget.

A new method utilizing gas chromatography with headspace technology was also developed for volatile compounds. This technique has proven very useful in detecting compounds involved in inhalation, exposure and fire deaths.

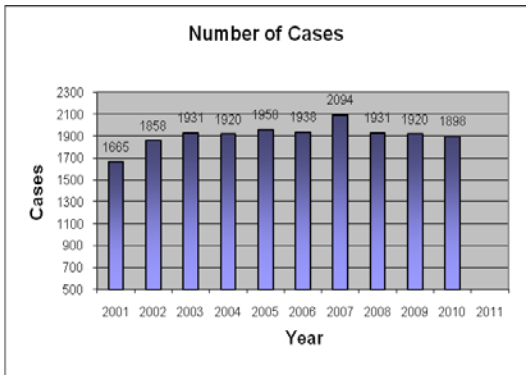
Analytical methods for alcohol and simple volatiles were also re-developed to utilize hydrogen gas in place of expensive bottled helium. The hydrogen gas is generated in the laboratory from purified water at essentially no cost to the laboratory. At the same time, the redeveloped procedure has proven to be faster, more sensitive and more accurate.

WORKLOAD DATA FOR 2010 IN COMPARISON TO PREVIOUS YEARS

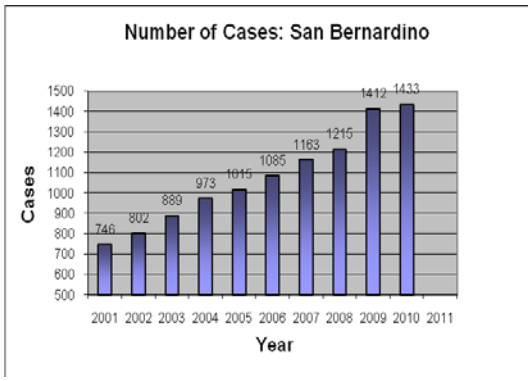
The forensic toxicology laboratory performs testing for the San Diego county Medical Examiner and, under contract, for the San Bernardino Coroner.

As the data illustrates below, the number cases examined were essentially the same compared to the previous year. A total of about 3,330 cases each year. However, there was an increased complexity of testing requested. There were increased requests for the monitoring of therapeutic drugs, vitreous chemistries and volatile screens in cases from both San Diego and San Bernardino.

San Diego Medical Examiner:

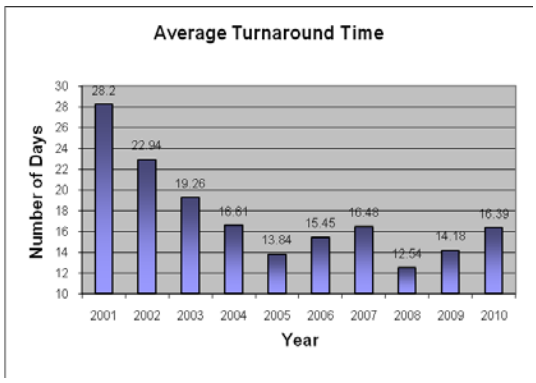


Contracted services for the San Bernardino Coroner:

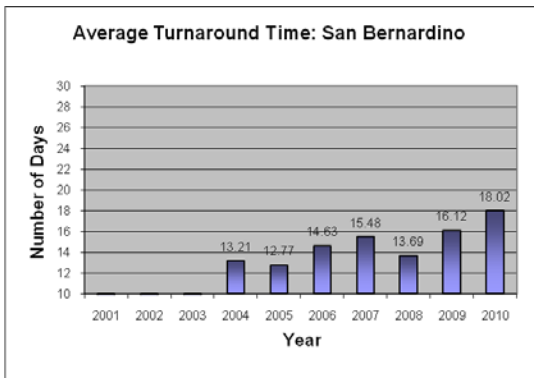


The average turnaround times (shown below) for the completion of cases increased slightly. The average turnaround time increased from 14.18 to 16.39 days (15% increase) for the San Diego Medical Examiner, and from 16.12 to 18.02 days (12% increase) for the San Bernardino coroner. This is most likely a result of the greater complexity of tesing requested, and the loss of a toxicologist position during the year.

San Diego Medical Examiner:



Contracted services for the San Bernardino Coroner:



PUBLICATIONS

Cantrell, F.L., Nordt, S., McIntyre, I.M. and Schneir, A. "Death on the Doorstep of a Border Community- Intentional Self-Poisoning with Veterinary Pentobarbital." Clinical Toxicology, 48 849-850, 2010.

"County toxicology lab stands out"
by Morgan Cook of the North County Times-The Californian

http://www.nctimes.com/news/local/sdcounty/article_8ffcd5d7-47ca-5c39-afc1-ef1ad2ae83c6.html

"County improves disease screening: Toxicology lab hones test for diabetes, kidney failure"
by Morgan Cook of the North County Times-The Californian

http://www.nctimes.com/news/local/sdcounty/article_4a2b3053-ca9d-5f8e-b558-2f91a00f3d91.html