

## Piecing It Together to Discover the Unknown

Editor Ty Weaver

A powdery substance found in a plastic bag might be cocaine or it might be powdered sugar. Is this pill an opiate or is it only a multi-vitamin? How does a laboratory determine the difference between the two substances?

One Source Toxicology is one of a few SAMHSA laboratories to offer unknown substance testing to its clients. The process for this type of testing is more difficult than target based drug testing.

First the substance is chemically separated from its multiple components using a laboratory technique known as an extraction. The purpose is to get an absolute pure sample prior to testing. The complexity of the extraction is compounded with the addition of interfering substances. Drug dealers increase profits by adding interfering substances to increase the volume of product while decreasing the volume of the drug. Arsenic, which is sometimes added to cocaine, can increase one gram of cocaine to two grams of cocaine.

The extracted sample is analyzed using a gas chromatograph mass spectrometer (GC/MS). The GC/MS identifies the extracted sample by determining the unique chemical composition of the sample. The GC reduces the sample to its molecular structure by using heat and a separation column. The MS identifies the unknown molecular pattern of the compound corresponding with a known substance stored in a data base library.

The molecules break into the same patterns, sort of like a fingerprint. Steve Harris, the laboratory responsible person, said, "Try to imagine a car crashing multiple times. Every time the car crashes it fragments exactly the same way every time. It's impossible in nature, but not in science."

After this process is complete, a certifying scientist compares data from the test to data in a mass spectrometry library to identify a match 90 percent or greater. Comparing data is similar to placing a puzzle together.

The extraction procedures of the unknown substance and the comparison of data make this type of testing difficult for a laboratory to provide a definitive result. To perform the actual test takes approximately 10 to 15 minutes. To produce a result, starting with the extraction and finishing with identifying the substance with the mass spectrometry library, could take laboratory staff 10 business days to complete.

One Source Toxicology is authorized by the Drug Enforcement Administration to perform this type of drug test. One



**Once the specimen is tested, a certifying scientist compares test data to standardized results stored in a mass spectrometry library. This timely process is similar to placing a puzzle together.**

Source Toxicology has performed tests on unknown substances for the Houston Police Department, HASAP Contractors, and independent school districts.

## XANAX Causes Problem\$

Editor Ty Weaver

The most accessible illicit drug is not found on the streets, but rather in your home. Pharmaceutical drugs are some of the most popular abused drugs, especially among adolescents. Xanax® is one of the most popular abuse pharmaceutical drugs.

Xanax is the trade name for Alprazolam, which is a benzodiazepine prescribed to relieve anxiety, nervousness, and tension. It is often referred to its street name, "bars" or "handle bars," because of the two hash marks indented on the tablet. The hash marks allow the tablet to be broken into three sections. The tablets usually contain two milligrams per dosage and have an extended-release formula to allow the medication to digest slowly into the body after ingestion. Once the drug is broken into sections the extended-release formula is canceled; therefore, the effects are greatly increased.

The drug is popular for its fast reaction time and the dramatic effects on the user. Anti-anxiety medication is developed to work rapidly to treat a panic disorder immediately. If the dosage is high enough, the effects of the drug will cause euphoria, drowsiness, or disorientation. Xanax can have potential for high physical and psychological dependency if abused.

Xanax is one of the most commonly prescribed medications to treat anxiety disorders for adults. The drug is often taken on a needs basis; consequently, accessibility to the drug is readily available to adolescents as it is left over in a parent's medicine cabinet.



**The most common form of Xanax is white, oblong, and divided into segments. The segments are broken off, giving the drug its streetname, "bars."**

Taking Xanax with alcohol increases the effects dramatically. The effects of Xanax mixed with alcohol are slurred speech, drunken behavior, disorientation, and withdrawal.

After a prolonged use of Xanax, an abuser might become dependent on the drug. A severe side effect associated with Xanax withdrawal is a grand mal seizure, which is an epileptic event. A person frequently taking Xanax can build up a tolerance. The user might run out of their supply or quit abruptly; as a result, the person will have seizures spontaneously.

Grand mal seizures are costly, as emergency department visits with these symptoms can have medical expenses in excess of \$10,000. A doctor will order CAT scans on the patient only to find no neurological signs of any tumors. Frequently, the reason for a person having seizures is Xanax withdrawal.