CHAPTER 12: DRUG AND DWI TESTING PROTOCOLS ENSURE DATA ACCURACY

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EVIDENCE

The way in which data are gathered can affect whether you are wrongfully accused of crimes and can affect your success in challenging the evidence. This chapter considers the way in which drug tests should be and are required to

SECTION 1

Your Scientific Rights

The technology to identify criminal activity is finding increasing use in both the courtroom and the workplace. Whether the method be a breathalyzer test, a test for illicit drug use, DNA fingerprinting, or other, the average citizen (as juror, witness, or defendant) can easily be overwhelmed by the scientific, technological aura of these methods. Yet, technology does not guarantee accuracy, and the public should not place blind trust in the application of such technologies, especially when someone's liberty or life is at stake. As a society, we want the benefits of these new technologies, but at the same time, we want to make certain that they are applied in a fair manner.

Short of learning the technologies yourself, there are a few simple steps you can undertake to determine whether such technologies are being applied fairly. The law does not explicitly guarantee an individual's right to sound scientific practices when gathering evidence to convict them, but one's constitutional right to a fair trial can certainly be argued to include these rights. Any test used against you should have the five relevant features of ideal data. Unfortunately, although a good defense attorney might be able to insist on the criteria of ideal data in court, corporate use of scientific data to fire employees is not subject to such scrutiny: a drug test may be used as the basis of job termination without the employee's knowledge of the basis for dismissal. On the positive side, however, the Department of Transportation has instituted a lengthy and detailed protocol for lab-based drug-testing and alcohol-testing, which incorporates several features of ideal data. In what follows, we list the elements of what we regard as a fair drug test and note whether the features are included in the Dept. of Transportation rules (DOT rules). By and large, the DOT rules go a long way toward ensuring that ideal data criteria are met. The last part of the chapter deals with DWI data that are not part of lab testing under the DOT.

A Fair Drug Test

The following sections consider each of our ideal data features, first describing our model of a fair drug test and then followed by the relevant features prescribed by the DOT. A summary of whether the DOT rules match the features of ideal data is offered below.

GOAL: ASSESS WHETHER THE CONCENTRATION OF A DRUG EXCEEDS A THRESHOLD		
MODEL BEING TESTED: THE DRUG LEVEL IS BELOW THE THRESHOLD		
DATA FEATURE	**RELEVANT**	**STATUS**
Explicit Protocol	Yes	Present
Replication	Yes	Present
Standards	Yes	Present
Randomization	Yes*	Present
Blind	Yes	Present

* Randomization is relevant for certain civil rights issues but is not a major factor in data accuracy in this case

SECTION 3

Explicit Protocol

Ideally:

The protocol for gathering, analyzing, recording and reporting the findings should be published before any drug tests are conducted. It should explicitly cover: 1) the procedures used to collect the specimens, 2) the criteria or methods used to decide which employees will be tested, 3) how the specimens will be handled between collection and being received by the testing laboratory, and 4) the experimental protocol employed by the testing laboratory, and 5) what information and specimens will be stored as a permanent record.

DOT rules:

The Department of Transportation has developed a comprehensive protocol for its drug testing program. The details are presented in the Federal Register 49 CFR PART 40 and described in the 100+ page pamphlet "Guidelines for Implementing the FHWA anti-drug program" published by the DOT in 1992. These rules specify which records are to be maintained, how long samples must be kept, procedures for handling and transferring specimens, what kinds of tests are to be performed on which classes of employees, and many other features needed for a program of this nature. More important for our purposes, these rules specify a number of features that pertain to our five additional design features, as explained next.

Standards

Ideally:

Each batch of samples sent to the testing laboratory should contain several standards, some known to be non-positive and some known to be positive. The testing laboratory should not be told which samples are standards. The company should publicize the results of the standards.

DOT rules:

Standards are included at two levels. The testing laboratory itself is required to include samples of known concentrations in each run. These standards enable them to calibrate the test procedure and thus to determine drug concentrations in the unknowns. As an additional standard, each manager whose employees are tested is required to include 3 known blank samples (lacking drugs) for every 100 unknowns; managers with more than 2000 drivers must also include some standards known to contain drugs. The rules do not specify publication of the results but they require that the DOT be notified of all "false positives," so the information should be accessible. Whether the data are, in fact, treated this way would be difficult to determine.

Replicates

Ideally:

Each sample should be divided into at least two tubes. One should be retained as a voucher for re-testing, if necessary. The other should be sent to the testing laboratory. An even better design, however, would be to split the sample three ways, sending two for independent testing at different laboratories. After the tests are completed, the company should publicize what percent of the replicated samples came back with inconsistent results.

DOT rules:

As of 1994, replication is required in the form of a "split sample" collection (at least for urine tests). Split sample collection simply involves the partitioning of the original sample into two vials. One vial is sent for testing, whereas the other is retained for retesting in the event of a positive result on the first vial. The rules specify that the retest is to be conducted by a different laboratory than did the first test. Retesting is not automatic, however: the person being tested must request the retest. In addition, the lab uses the original sample for multiple-stage testing - the specified procedure is that all samples are tested with an initial and rapid screen, and only the positive ones are analyzed more comprehensively. The rules specify that written records must be kept, but we are not aware that the results of replications must be published or made generally available.

Random

Ideally:

The decision about which employees are tested should be random. There may be special circumstances which invariably warrant testing so that no element of choice is involved (e.g., a driver involved in some kind of accident), but if a choice is to be made from a group of otherwise equivalent individuals, that choice should be random. Random choice here is not so much to reduce error but to avoid abuses.

DOT rules:

One form of required testing is random. The rules specify that the choice in "random" testing must be made in a strictly random manner, with suggested methods being the use of random number tables or names on slips of paper drawn from a bin. The rules further specify that sampling with replacement must be used: an individual tested in the previous round is eligible to be chosen in the next round.

Blind

Ideally:

All samples should be labeled with a number, not a person's name, when sent to the testing laboratory. Standards should be indistinguishable from the unknowns so that the lab is not explicitly careful just when processing the standards. Additionally, the testing laboratory should receive no correspondence concerning which specimens the company suspects might be positive.

DOT rules:

Blind testing is used at two levels. Most importantly, names are not included with the samples; the name of the person being tested is kept only on a single form (one of 3 copies) with the manager requesting the test. In addition, the standards are to be labeled in ways that make them appear as ordinary samples.

SECTION 8

Avoiding Deliberately Falsified Test Results

In science, the penalty for being caught falsifying evidence is complete and total ostracization from the scientific community. However, perhaps the major deterrent against fraud in academic is the high probability of being detected: any important discovery will be checked and verified by other scientists. Drug tests are different because there are no repeated cycles of evaluation and revision. That is, if your blood or urine tests positive by a fraudulent procedure, the authorities will not come to you later and take another sample to confirm the result. It is thus imperative that procedures be implemented to guard against falsification of test results. Of course, the use of replicates, standards, and blind procedures help in this respect. But the rules also further safeguard against falsifying results by requiring tamper-proof labels and requiring that all tests results be sent to an independent 3rd party (the medical review officer) before being returned to the office originating the test. In general, the DOT rules are far more specific about matters of personal liberties and rights than is the typical procedure in science, largely because most matters of pure science do not impinge on people's rights and freedoms, and they can be verified at a later date.

DWI Field Testing

Providing a blood sample for DWI testing should subject the analysis to the usual DOT rules because the sample is processed in a lab. However, providing breath samples or taking the SFST are done on site and don't necessarily have all those safeguards. At least in Austin, a breathalyzer test involves two types of standards, with known concentrations of alcohol and alcohol-free samples. Furthermore, the subject provides two breath samples (replication). So sampling error, human/technical error, and bias should be minimized; there is little opportunity for bias, so blind and randomization are not necessary.

A more problematic measurement is the score on the SFST. To ensure data accuracy, the SFST involves:

1. a formal protocol for scoring, including a point system
2. a formal protocol for giving instructions
3. replication in the form of 3 tests (one leg stand, walk & turn, horizontal gaze nystagmus), although failure on any one test (which requires two mistakes) is grounds for arrest
4. in many cases, a video tape of the driver's performance is taken, which provides a type of standard by enabling another observer (e.g., the court) to judge the performance.

When there is no video record of the test, the score will be almost impossible to challenge because there is no basis to evaluate the officer's scoring. This is a serious drawback of the test, although video cameras are now standard features of most patrol cars in this state. Perhaps the main drawbacks of the SFST when a video record is obtained are (i) the HGN test cannot be reliably interpreted on the video, and (ii) there are no baseline data for the SFST, either for the population at large or for the individual being tested. In the few rigorous studies of SFST performance, there are no data for our population that establish failure rates for sober people, which would be considerable, especially among older people. Such a database might work against using the SFST in some cases, because it is undoubtedly the case that thresholds for arrest are stringent. (I would speculate that a majority of people over 65 would fail it when sober because coordination declines with age.) Although baseline data for an individual could be provided at a later time, they never are. Nor would the performance of the arrested individual when sober be a blind measure of their ability, as there would be a strong incentive to perform poorly when establishing a baseline. However, as the HGN is involuntary, baseline data could be provided after the fact.