

Substance Misuse Analysis for Family & Children Law

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Substance misuse, which includes both drug & alcohol misuse, is not a new problem, but an escalating one within the UK as well as on a global scale. Not only are individuals affected by their own usage, but since the majority of substance abusers exist in a social context, which includes family members, either as parents, siblings, partners, children or wider kin (Velleman et al, 2003) the number of those affected are significantly increased.

Recent figures have estimated that there may be 250,000 – 300,000 people with a serious drug problem in the UK (Home office, 2002) and over 1.8 million adults using alcohol at a harmful level (more than 50 units a week for men 35 for women – Office of National Statistics, 1997). If we were to use a conservative assumption that every substance misuser will negatively affect at least two close family members (Copello et al, 2000), then approximately 4.2 million people in the UK alone are living with the negative consequences of someone else's drug or alcohol problem. This leads to a huge financial cost, where an estimated £40 billion per annum is spent on substance misuse in the UK, due mainly to expenditure on health and social care, absence from work, criminal activity, and costs to criminal justice system.

What is Substance Misuse?

Substance Misuse can be defined as the use of illegal drugs and/or the misuse of other substances likely to lead to adverse physical and mental effects. There are many forms of substance misuse, and the motivation for consumption can range from recreation to depression; with possible serious health implications for users. Five stages can be used to define a user's progression through substance misuse, starting with experimentation, moving on to regular use, risky use, dependence and finally addiction. It is important to realise that substance misuse is treatable, usually with close cooperation between the user and the healthcare provider. Before any treatment can be offered, the first stage is to identify which substances are being misused, at what levels and over what periods of time.

Identification can be a complicated process due to all the different classification of substances (illegal, legal controlled & legal) and the interactions between substances. Some people will mix and match different drugs to get enhanced or new effects, or the two components are legal and easily available for example alcohol and over the counter pain killers (figure 1).

Detection of Substance Misuse

Although alcohol is a drug, for the purpose of detection it is better to consider it in it's own category separate from conventional "drugs", which can be defined as any substance that is used to modify a chemical process or processes in the body, for example to treat an illness, relieve a symptom, enhance a performance or ability, or to alter states of mind. A number of laws have been implemented in the UK to control the manufacture and supply of medicinal drugs (Medicines Act 1968) and prevent the misuse of non-medicinal drugs (Misuse of Drugs act 1971). Non-medicinal drugs are the drugs used for recreation and comprise mainly of psychoactive drugs, drugs that that affects the brain to produce alterations in mood, thinking, perception and

Figure 1 – Overview showing the many different interactions between legal and illegal substance misuse.



which can give the doctor, nurse or specialist a guide as to whether or not your test is within the range for normal function or is outside of the normal range and may be abnormal. How abnormal can be assessed from the variation below or above the normal range. The level of accuracy in identifying whether an individual has alcohol dependency is greatly increased by combining the above tests. Moreover, the tests have a high negative predictive value (between 83 and 91%) making them very useful in identifying individuals who are not dependent.

Carbohydrate Deficient Transferrin (CDT) Test

Transferrin (Tf) is a globular glycoprotein produced by the liver and found within blood serum. The primary responsibility of Tf is the transportation of iron, however, it is also one of the most accurate markers used to indicate chronic alcohol consumption by clinicians and researchers due to its sensitivity and specificity (Sillanaukee, P. 1996). Carbohydrate Deficient Transferrin (CDT) is a collective term referring to the isoforms of transferrin which are produced when blood alcohol levels are increased. Stibler & Kjellin (1989) first reported the increased presence of transferrin isoforms (transferrin protein molecules with slightly altered chemical structures by loss of carbohydrate molecules) in serum obtained from alcoholics, which normalised after abstinence with a mean half-life value of 14-17 days. This means that for most people who are alcohol dependent their elevated CDT level will be detected even if they have abstained for a short period before the test.

The current hypothesis for the mechanism is that increased ethanol in the blood affects the structure of the transferrin protein by removing/inhibiting the binding of carbohydrate molecules resulting in increased levels of CDT (Niemela et al 1995), which can be detected by means of a standard blood test conducted by a GP.

Studies have shown that CDT values increase after 10 days of alcohol consumption at a level of 50-80 g ethanol per day indicating consistent consumption (Anton et al. 1994), this makes CDT a suitable biochemical marker for routine work in the detection of alcohol abuse and for monitoring either abstinence or relapse during treatment.

Interpretation of results

In interpreting the results from LFTs & CDTs, certain considerations must be taken into account. For example in a CDT test, false results may occur in individuals suffering from chronic hepatitis, cirrhosis and other related conditions, however these conditions would cause corresponding anomalies in the LFT results. For these reasons, combining LFT tests with a CDT test increases the level of confidence in results than simply utilising one test technology in isolation.

Drug Analysis, the LFT test and the CDT test are useful tools for specialists to call upon when dealing with drug & alcohol abuse & addiction. However, they do only provide part of the overall picture which make up addiction assessments and should not be solely relied upon.

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Arjun received his Masters from Imperial College in 2004 specialising in Molecular Biology and is now using his extensive knowledge base to assist and develop the business for clients needs. Having successfully provided professional development training to over 300 clients across the UK, Arjun is now developing our professional training programmes to educate clients on the benefits and limitations of Hair Drug testing and substance misuse.

For further information on our CPD training courses please contact Trimega Laboratories on 0845 388 0124, visit our website at www.trimegalabs.com or email us at info@trimegalabs.com

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