

Alcohol goes to the Hair not just the Head

DETECT YOUR CLIENT'S ALCOHOL LEVELS FOR UP TO 12 MONTHS

The ability to test your client's hair alcohol levels and gain a snapshot of their alcoholic past is now made possible through the introduction of Hair Alcohol Testing in the UK.

Recently launched by Trimega Laboratories Ltd in April 2007, this new method of testing has been adopted by numerous courts and legal and family advocates across the UK. For the first time ever, there is a non-invasive method of establishing long-term excessive drinking for up to 12 months.

ALCOHOL ABUSE – THE FACTS

It is difficult to quantify the impact that substance misuse has on families. The use of drugs and alcohol is often one of many factors that places stress on family relationships. Substance misuse is associated with domestic violence, marital break-up, unemployment, and parenting problems.

"Researchers have observed high levels of mental health problems among relatives of people who misuse alcohol and drugs". Further, children of problem drinkers are more likely to have behavioural problems, school related problems, and to use alcohol and drugs in a problematic way than children of non-problem drinkers.

Current estimates indicate that 780,000 to 1.3 million children are affected by parental alcohol problems and between 250,000 and 350,000 children of problem drug users in the UK¹.

There are an estimated 1.3 million parents with alcohol misuse problems in the UK and 350,000 parents who have serious drug problems in England and Wales². Of these parents who misuse drugs it is estimated that only 37 percent of fathers and 64 percent of mothers still live with their children³.

Childline, a free 24 hour helpline for children and young people across the UK received calls from just under 140,000 children in 2004/2005. Analysis of these calls suggests that more children are affected by parental/carer alcohol misuse than drug misuse. In 2004/2005 the number of callers who spoke to Childline about significant other's alcohol misuse was over double the number who called primarily to talk about significant other's drug misuse (3,442 compared to 1,600).

It is therefore not surprising that substance misuse (particularly alcohol) is a problem for a large proportion of children and families on social work caseloads in the UK. A 2002 Nuffield Foundation study reviewed the cases of 290 children allocated for social work cases across four London boroughs. Sixty two percent of

the children involved were subject to care proceedings and 40 percent were on the child protection register. The study found that the parental substance abuse affected 100 families, 34 percent of the total sample. 41 percent involved alcohol misuse, and 27 percent involved alcohol and drug misuse. Only 29 percent of the families involved had received support from substance misuse professionals⁴.

Furthermore, alcohol has just been classified as the fifth most seriously harming drug, after only heroin, cocaine, barbiturates and street methadone. Even more shocking is the fact that liver disease is the fifth highest cause of death in Britain and that alcoholics are just as prevalent in society as diabetics.

So it is not surprising that many legal, medical and HR professionals have been looking for a reliable test that tracks an individual's history of alcohol misuse.

ALCOHOL ABUSE TESTING EXPLAINED

Traditionally, excessive alcohol consumption has been monitored using the Liver Function Test (LFT), which indicates the degree of inflammation present in the liver, and the Carbohydrate Deficient Transferrin (CDT), which shows excessive alcohol consumption by looking at a specific biological marker in the blood. While useful in showing excessive

¹ L Templeton, S Zohhadi, S Galvani, and R Velleman, Substance Misuse Research Programme, 'Looking Beyond Risk' Parental Substance Misuse: Scoping Study, The Mental Health Foundation and The Scottish Executive, January 2006.

² The Prime Minister's Strategy Unit, Interim Report for the Prime Minister's Strategy Unit Alcohol Harm Reduction Project, 2003.

³ Advisory Council on the Misuse of Drugs, Hidden Harm: Responding to the Needs of Children of Problem Drug Users, June 2003.

⁴ The Young Foundation, Mapping Britain's Unmet Needs: A report prepared for the Commission on Unclaimed Assets, June 2006.

⁵ Grandparents Plus and Adfam, Forgotten Families, November 2006.

⁶ J Newman, 'Hidden Harm', Children Now, September 2005, pp 20-21.

alcohol consumption over the past three – four week period, the major limitation is the window of detection. There is still a valuable place for these tests, not least because they provide a fuller picture of alcohol abuse over a two – four week period. Hair alcohol testing extends that history significantly by providing a reliable and historical record of alcohol consumption for periods of up to one year.

The alternative provider in the Medico-Legal market for hair drug testing, Trimega Laboratories, have a patent-pending process of hair extraction for these markers, followed by interpretation of results against controls set with clinical data from alcohol users that allows them to distinguish teetotalers or social drinkers from alcoholics or individuals drinking at harmful levels.

When hair grows it absorbs a range of chemical markers that are locked in the hair in just the same way that the rings on a tree can tell us about the climate year by year. These markers, including fatty acid ethyl esters (FAEE's) only occur when ethanol ('alcohol') is consumed. The more alcohol an individual consumes, the greater the concentration of these markers in the hair.

Unlike hair drug testing, it is currently not possible to segment samples to give a month-by-month pattern, unless the donor has abstained from drinking for the most recent 3 months or more. The reason for this is that fatty acid derivatives measured are carried into the hair via sebum from the scalp and then down the hair shaft. So past periods of abstinence when followed by excessive alcohol consumption cannot be accurately tested.

ALCOHOL ABUSE TESTING EXPLAINED

Already the feedback and interest in this medical application since the launch has been remarkable. This latest technology is a beginning of a new era in substance misuse prevention insofar as early

identification of individuals that could place children at risk and families at risk.

For further information in relation to this testing. Visit www.trimegalabs.com Or contact 0845 388 0124

ALCOHOL ABUSE TESTING EXPLAINED

How is Hair Alcohol Testing done?

As the hair grows, it absorbs special markers called fatty acid ethyl esters (FAEE's) and ethyl glucuronide (EtG) into its structure, which remain in the hair indefinitely. These patented markers are only produced when there is alcohol in the bloodstream, and the more markers there are, the more alcohol has been consumed.

How can your client benefit?

If your client insists they have abstained from excessive drinking in the past three months, then no markers would be present in the 0-3cm section of hair from the scalp, and their results would show as a negative.

How does it differ from the current methods of testing for alcohol?

This new method differs from the current traditional methods of Liver Function Tests (LFT) and Carbohydrate Deficient Transferrin (CDT) where it provides a longer window of detection of alcohol abuse.

Can I recognise a pattern of abuse?

No, because we do not section the hair month by month and carry out periodic analysis. Our research has shown this is unsound scientific practice because the markers can migrate along the hair shaft.

Can relapse drinking be detected after long periods of abstinence (e.g. in rehabilitation)?

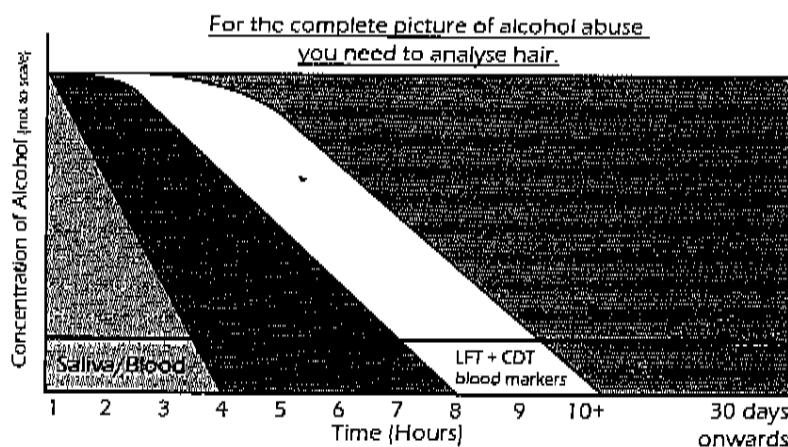
Yes, after 2 to 4 weeks of excessive consumption. (It takes 6 – 9 days for the metabolites in the hair to reach the surface of the scalp).

Can I use body hair?

Yes, but the rate of growth is more difficult to predict, and we cannot give a timescale for the sample.

What if my shampoo or hair product has alcohol within it?

Products containing alcohol will not affect the result. We look for the alcohol metabolites which can only be produced by alcohol that was in the blood. Blood alcohol also combines with fatty acids in a special way and we look for those. We will only report a positive result when these independent markers are detected in their correct ratios. So the analysis is foolproof.



How much hair do you need?

We require about 100 mg of hair. That is a tuft of hair a bit bigger than the size of a pencil diameter. The hair can be taken from more than one location, and the sampling site is usually unnoticeable.

How do I take the hair sample?

We have trained collectors to do that for you, or we can train someone at your firm to do the collection. Collection is an important part of the process and nearly always needs to be done under strict 'chain of custody' rules so that everyone involved can be certain that the sample relates to the correct person.

What are the limitations?

Obviously, we need hair. Occasionally drug screening companies encounter someone who has shaved from head to foot, with not a single hair on their body, but that does obviously raise suspicions.

What information will the report have?

It will include the identity details for the sample that you sent us, and then a result for the alcohol level if it is above our cut off level which indicates alcohol consumption is excessive. In that case we will report an actual figure for the result.

Results can also be provided in a standard Section 9 legal statement where requested.

Can you determine how much alcohol a person has had monthly?

No. Although we will give a value in our report, we can only say that the value exceeds our interpretation of the cut off level we have set, which is 60 grams of alcohol per day over a protracted period. We cannot interpret how much alcohol was actually consumed. To do so would be scientifically unsound because alcohol is metabolised in slightly different ways by different people.

How does alcohol in hair chart against alcohol units?

The alcohol markers relate to actual units because our cut off level is equivalent to 60 grams per day over a period of time.

One U.K. unit is 8 grams or 10 ml of pure alcohol. The amount of drink that equates to 60 grams depends on how strong the drink is. So on average we can assume about seven units daily could result in a positive.

Why would I use hair instead of blood?

Only hair will give a history. Blood is used for drivers who are actually intoxicated, but alcohol in blood decays at the rate of about one unit per hour, so is lost quickly. However while the blood is feeding the hair root, minute traces of alcohol metabolite become trapped in the hair to give an alcohol history which we detect when we analyse the hair.

What is the difference between LFT and CDT tests?

These two current tests are based on a sample of blood. LFT tests are a suite of *liver function tests* and they detect markers that indicate whether the liver is damaged or inflamed. However these markers require specialised interpretation. The CDT test is a *carbohydrate deficient transferrin* marker that becomes elevated when alcohol is consumed to excess. But neither of these tests is a substitute for hair testing because only hair tests will go back in history.

Will this stand up in court if a court has never used it before?

Yes. The method has been fully validated, although until the courts accept values without question it may be necessary to provide expert witness evidence to support results. We have forensic experts who would be happy to support this evidence in court.

Jim Campell

I was trained as an analytical chemist in criminalities and toxicology at a Home Office Forensic Laboratory, where part of my duties involved examination and analysis of drugs and drug paraphernalia. Subsequently I have worked for over 15 years in private practice in drug analysis including the detection of drugs in hair. I have also received specialised toxicology training at the largest hair testing laboratory in America. I have dealt with a large number of forensic investigations, including a variety of drug related cases requiring court appearances to present evidence as an expert. I have provided over 300 expert witness statements and reports to the UK courts in the last 12 months'