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Hair strand testing in family law

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clear evidence - expertly delivered

TAKING A STRAND

Time to tackle overreliance on hair strand drug tests in the family courts

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Several Court of Appeal cases highlight concerns with reporting and interpretation

Reporting and interpretation of the results of these tests can be oversimplified and highly misleading

There are many variables that must be taken into account in hair strand testing, including in relation to hair colour, race, hair condition and treatments, and pregnancy

There is a real danger that, by using standardised cut-offs, those who are Black or Asian are more likely to lose custody of their child.

Family Justice Council

Re D [2024] (Children Interim Care Order Hair Strand Testing) [2024] EWCA Civ 498 Cobb J

- It is still an evolving field, and, as previous case law has cautioned, **hair strand testing has its limitations**.
- The variability of findings from hair strand testing does not call into question the underlying science but emphasises the need to **treat data with proper caution**.
- Duty on advocates to tell the court what HST can and can't tell you (as explained in Islington v M and RE H)
- Reviewed earlier case law – now elevated to CoA level.

Re H (A Child: Hair Strand Testing) [2017] EWFC 64, Peter Jackson J

- Most of the information is factual, and in some cases, it will be interpreted by experts, who will **express an opinion**. That will be the case when scientific investigations such as hair strand tests are carried out.
- These tests can provide important information, but in order for that to be of real use, the expert must
- (a) **describe the process,**
- (b) **record the results**, and
- (c) **explain their possible significance**, all in a way that can be clearly understood by those likely to rely on the information.
- **Fully and faithfully report all findings**

Re H (A Child: Hair Strand (cont)

- There is a risk that the results will acquire a **pseudo-certainty,** particularly because (unlike most other forms of information in this field) they appear as number

- "There are variables in relation to hair colour, race, hair condition (bleaching and straightening damages hair), pregnancy and body size. Then there are the variables inherent in the testing process."

Islington v M and another [2017] EWHC 364 (Fam) Hayden J

- Disagreements focused entirely on the interpretation of the results
- Three experts in case agreed hair strand testing **should <u>never</u> be regarded as determinative or conclusive** (London Borough of Islington v M and another [2017] EWHC 364 (Fam) (Hayden J)
- Interpretation of results not always free from controversy
- SOHT published guidelines (based on 2012 research) – are guidelines not a "straight jacket of rules"

London Borough of Richmond v B [2010] EWHC 2903 Molyan J

This is **expert opinion evidence**.

Practice direction applies- It is not advisory, it is mandatory

- The court and the parties need to have available all the information necessary to understand what weight can be placed on the evidence.

Drug testing only part of the evidential picture, should not be used to reach evidential conclusions

Practice direction Experts in the Family Proceedings relating to children [2009] 2 FLR 1383

- [3.2]……an expert shall have regard to the following duties:
- (1) to assist the court in accordance with the overriding duty;(2) to **provide advice to the court that conforms to the best practice of the expert's profession**; …[3.3]
- (8) in expressing an **opinion to the court:** …
- (b) describe their own professional risk assessment process and process of **differential diagnosis**, **highlighting factual assumptions**, **deductions from factual assumptions**, and any unusual**,** contradictory or inconsistent features of the case;
- (c) highlight whether a proposition is a hypothesis (in particular a controversial hypothesis) or an opinion in accordance with peer **reviewed and tested technique, research and experience accepted as a consensus in the scientific community; …**
- **(**9) where there is a range of opinion on any question to be answered by the expert:
- (a) summarise the range;
- (b) highlight and analyse within the range of opinion an 'unknown cause', whether on the facts of the case (for example, there is too little information to form a scientific opinion) or because of limited experience, lack of research, peer review or support in the field of expertise which the expert professes;(c) give reasons for an opinion expressed: the use of a balance sheet approach to the factors that support or undermine an opinion can be of great assistance to the court".

Has any of this been applied?

- Full and faithfully report all findings? Not report below the cut off level?
- Highlighting factual assumptions, deductions from factual assumptions, and any unusual**,** contradictory or inconsistent features of the case???
- The court and the parties need to have available all the information necessary to understand what weight can be placed on the evidence
- Balance sheet?
- Bring attention to the court research, recent developments?

Change is coming?

- FJC review
- Jersey conference on addiction – sea change???
- Our responsibility working in the family justice system
- "*Obligations on those who seek to rely on scientific tests*"… "*Tests were misdescribed and misunderstood*" (RE D, Peter Jackson) What should we do?
  - Evidence properly instructed
  - Evidence properly understood and explained
- Resource pages – https://www.coramchambers.co.uk/resources/hair-strand-testing-resources/

Resources Coram Website

Articles

Recent scientific developments in hair strand testing and racial bias in current practices of hair strand testing

Sarah Branson, *Barrister, Coram Chambers*
Paul Hunter, *Technical Director, Forensic Testing Service Ltd*

Sarah Branson is a barrister at Coram Chambers, specialising in acting for children, parents and local authorities in the most complex public law proceedings. These can include non-accidental injury, sexual abuse and serious violence, involving the death of a parent or a child. Sarah also has a thriving private law practice representing parents and children in the most complex disputes.

Paul is an accomplished expert witness in the field of drug and alcohol testing, with over 20 years' experience developing and running specialist substance-misuse analytical laboratories. An innovator in the development of best practice since 1999 and subsequently driving improvement in the family court through the provision of forensic investigations of hair and nail samples since 2007, he is a member of the Society of Hair Testing and the International Association of Forensic Toxicologists.

The use of hair strand testing for drugs and alcohol has been around for over twenty-five years, and is now commonplace in the family courts. Despite case law setting out its limitations as examined below, a positive hair strand test will often lead to the seemingly irrefutable conclusion that drugs or excessive alcohol have been consumed. Often conclusions are drawn about the amount of drugs consumed from the tests alone.

A positive drug test in the face of a denial about using substances (or using them at the levels suggested) will lead to professionals, working with that family, to accuse them of being dishonest about their substance misuse problems, lacking insight or being in denial.

Despite the certainty with which these results are often treated, studies and data accumulated over the past 10 years cast doubt on the reliability of previously drawn conclusions.

This article explores the recent academic research into this evolving scientific field and highlights areas where caution must be exercised in drawing definitive conclusions.It demonstrates that in many cases the standardised use of cut off levels used for interpretation and reporting hair strand testing, employed by the majority of testing companies, creates a racial bias and therefore caution must always be exercised when results are presented as 'positive' or 'negative'.

Drug testing basics

When a person uses drugs the presence of the drug within the blood stream becomes incorporated into the hair as it grows. This isn't the only way drugs can be incorporated into the hair, as is explored below. Also below, we explain the mechanism behind why hair is tested for drug use.

When a drug is metabolised by the body, a metabolite associated with that drug is produced and can be found in the hair as an

Articles

What next for hair strand testing in the family justice system: *Re D (Children Interim Care Order Hair Strand Testing)*

Sarah Branson, *Barrister, Coram Chambers*
Paul Hunter, *Technical Director, Forensic Testing Service Ltd*

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Racial bias in current practices of hair strand testing

As explained in the June 2023 publication of Family Law[1] the current use of cut-off levels in hair strand testing for drugs and alcohol is misleading and shows alarming racial bias.

You are more likely to face a finding of drug consumption if you have black hair than if you have blonde or red hair. Numerous studies have established that many commonly abused drugs (inc. cocaine and heroin) incorporate into the dark melanin (eumelanin). The more pigmented the hair, the more drug becomes incorporated for the same level of drug use.

In this study by Rollins[2] et al (Table 1) from 2003, all participants were administered the same high dose of codeine (which replicates heroin) at the same time in the same way over the same period and had their hair subsequently tested for both melanin content and the level of codeine incorporated. As outlined in Table 2, the results are striking. In the sub-category of black hair, it showed significantly higher drug levels among Afro-Caribbeans compared to Caucasians and significantly higher levels again among Asians compared to Afro-Caribbeans.

This demonstrates clearly that the application of cut-offs to report HST results are very misleading and should not be relied upon when reports are to be used in the court as evidence. There is significant potential for miscarriages of justice to occur

1 June [2023] Fam Law 669 'Recent scientific developments in hair strand testing and racial bias in current practice of hair strand testing'
2 *Journal of Analytical Toxicology*. Vol. 27 November/December 2003, Douglas E Rollins et all.

Is Hair Strand Testing Evidence Reliable?

- **The science** supporting hair testing is well established and **reliable**
- **Test results** can therefore be considered as **factual evidence** (the presence and identity of drugs)

However

- **Interpretation** of results does **not provide factual evidence**, this is **expert opinion evidence**
- **Hair is outside the body**, therefore unlike blood and urine, it is exposed to **numerous factors** that have a significant **impact on test results**
- For opinion evidence to be reliable, the expert must establish and consider all prevailing context and influences that combine to impact results and collect chain of evidence to minimise assumptions

So Why is 'Cut-Off' Reporting Unreliable?

- Interpretation and reporting by use of Cut-Offs **ignores:**
  - All prevailing influences (Hair colour, Hair hygiene, Hair treatments, Environment etc.)
  - All relevant context (previous history, changes in living environment, social patterns, etc)
  - Crucial Chain of Evidence (HD photography collection process, Observations, etc.)
  - All previous comprehensive case data files (Results with all above for each case)
- Results in misleading interpretations, misreporting and miscarriages of justice
- Furthermore, use of High, Medium and Low descriptors are misleading
- Evidence confirms that this oversimplified process **can't achieve *'balance of probabilities'* –** the standard of proof required for Care Proceedings
- Case Law concluded that reporting by use of cut-offs can not be used for court (Re H. 2017)

Cut-offs Do Not Meet Current European Guidance

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Critical analysis of forensic cut-offs and legal thresholds: A coherent approach to inference and decision

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ABSTRACT

In this paper we critically discuss the definition and use of cut-off values by forensic scientists, for example in forensic toxicology, and point out when and why such values – and ensuing categorical conclusions – are inappropriate concepts for helping recipients of expert information with their questions of interest. Broadly speaking, a cut-off is a particular value of results of analyses of a target substance (e.g., a toxic substance or one of its metabolites in biological sample from a person of interest), defined in a way such as to enable scientists to suggest conclusions regarding the condition of the person of interest. The extent to which cut-offs can be reliably defined and used is not unanimously agreed within the forensic science community, though many practitioners – especially in operational laboratories – rely on cut-offs for reasons such as ease of use and simplicity. In our analysis, we challenge this practice by arguing that choices made for convenience should not be to the detriment of balance and coherence. To illustrate our discussion, we will choose the example of alcohol markers in hair, used widely by forensic toxicologists to reach conclusions regarding the drinking behaviour of individuals. Using real data from one of the co-authors' own work and recommendations of cut-offs published by relevant professional organisations, we will point out in what sense cut-offs are incompatible with current evaluative guidelines (e.g., [31]) and show how to proceed logically without cut-offs by using a standard measure for evidential value. Our conclusions run counter to much current practice, but are inevitable given the inherent definitional and conceptual shortcomings of scientific cut-offs. We will also point out the difference between scientific cut-offs and legal thresholds and argue that the latter – but not the former – are justifiable and can be dealt with in logical evaluative procedures.

1. Introduction

Many analytical branches, in particular forensic toxicology, commonly rely on what are called cut-offs. These are numerical values against which measurements – known as sets of results – made on questioned items (specimens) are compared in order for target substances (e.g., metabolites) in hair. Such analyses are of wide interest and include, for example, workplace safety contexts, child custody disputes and sports (e.g., suspected doping cases). A further area where cut-offs are used is ink dating in forensic document examination. In this context, a numerical value for an ageing parameter – referring to certain components of ink entries

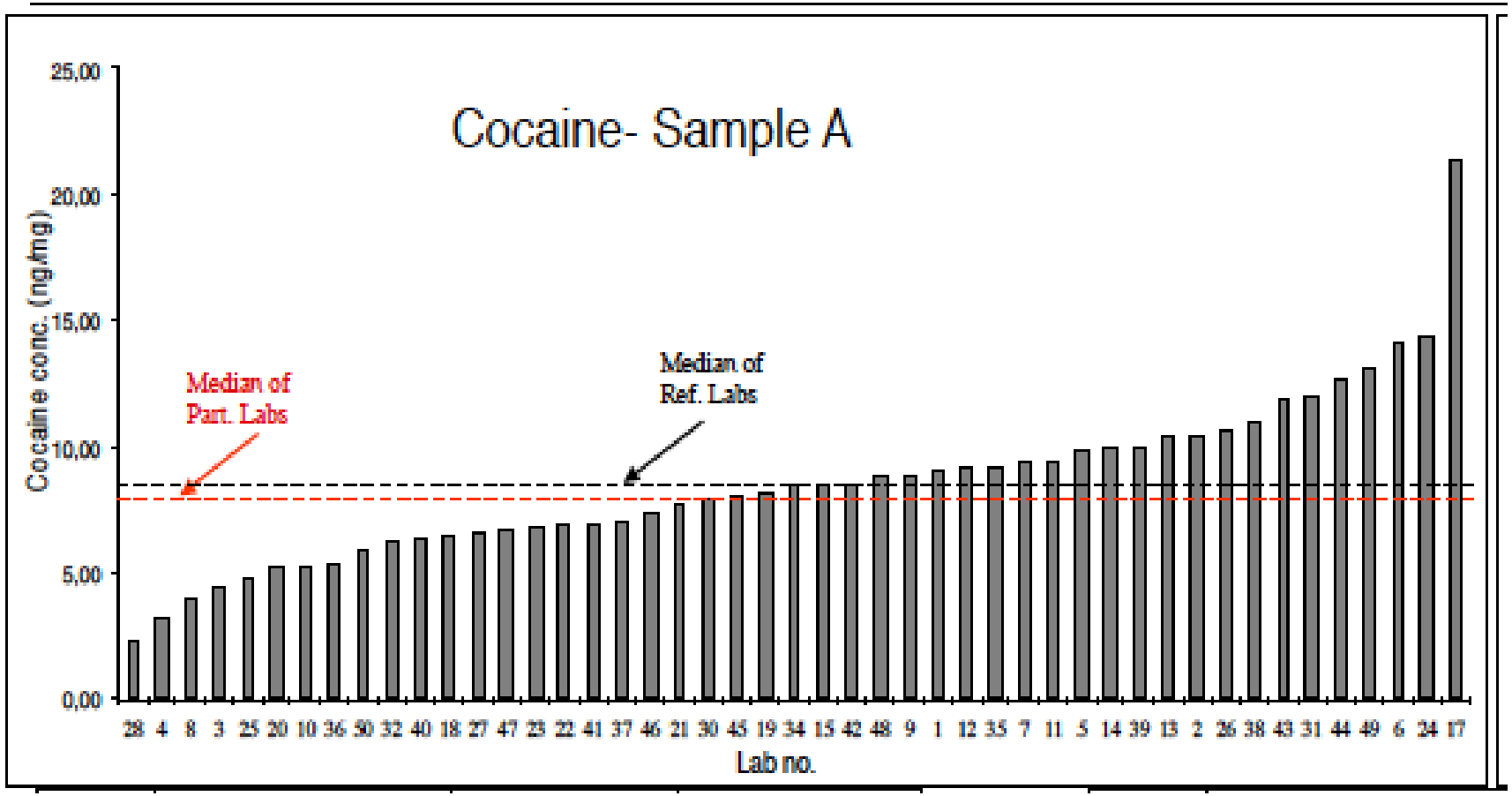
2.2.3. Incompatibility with current guidelines for evaluative reporting in forensic science

Current European guidelines for evaluative reporting in forensic science stipulate three main principles [2,8,31], all of which are not respected by reporting schemes based on cut-offs such as the SoHT consensus document [18]

". . . many practitioners – especially in operational laboratories – rely on cut-offs for reasons such as ease of use and simplicity."

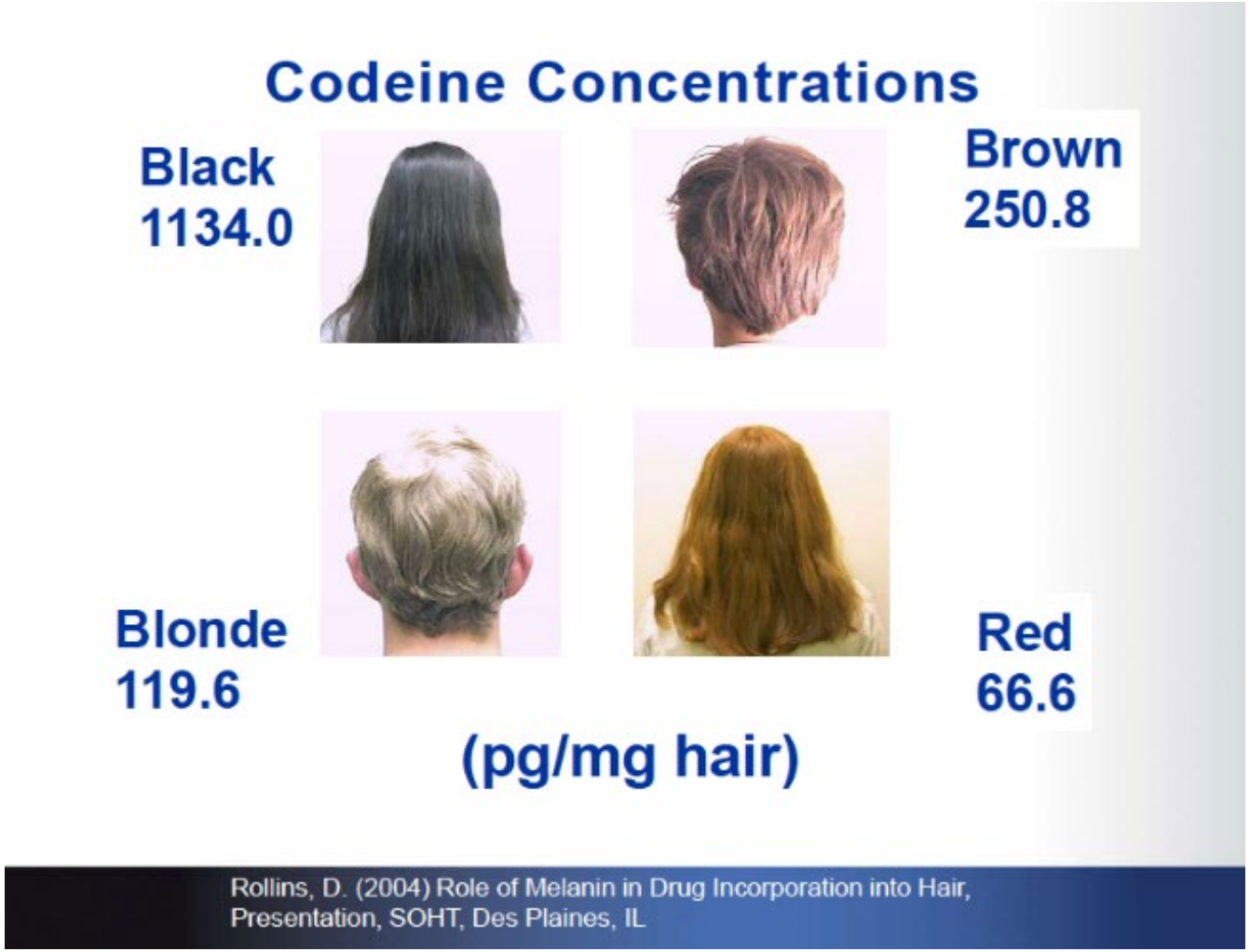
". . . we challenge this practice by arguing that choices made for convenience should not be to the detriment of balance and coherence."

Variability between Lab Test Results



- Different laboratories provide different results for the same samples
- This regularly results in some accredited laboratories reporting Positive results , and others Negative!
- This regularly results in some accredited laboratories reporting Positive, and others Negative for the same sample!

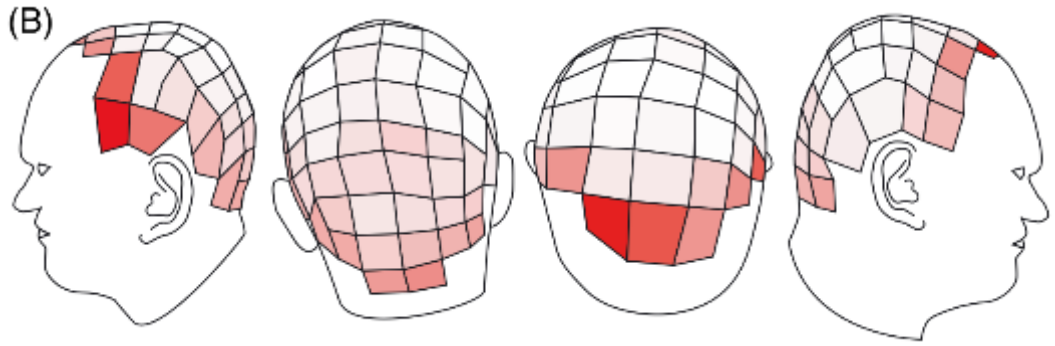
Influencing Factors - Hair Colour & Ethnicity Bias



- Participants in the study were all administered codeine (opiate) daily at the same dose over the same period.
- Hair samples collected and tested for codeine and melanin
- The higher the level of dark melanin the higher the level of codeine found in the hair
- Asian black hair has the highest level of melanin, red hair has the lowest
- When required, testing for melanin content in each hair segment can ensure hair colour and ethnicity are accounted for in the interpretation and opinions formed in each case.

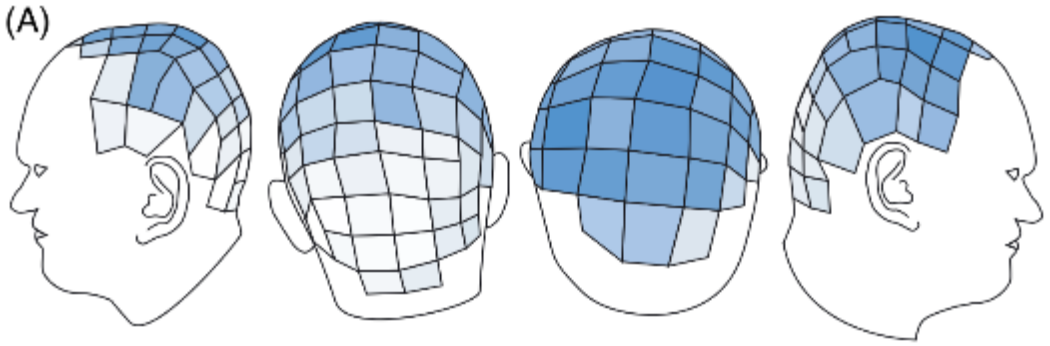
Influencing Factors - Hair Collection Site

Distribution of **Cocaine** Levels



- Variability of up to 105-fold difference in cocaine level reported
- Up to ~10-fold difference on adjacent sites

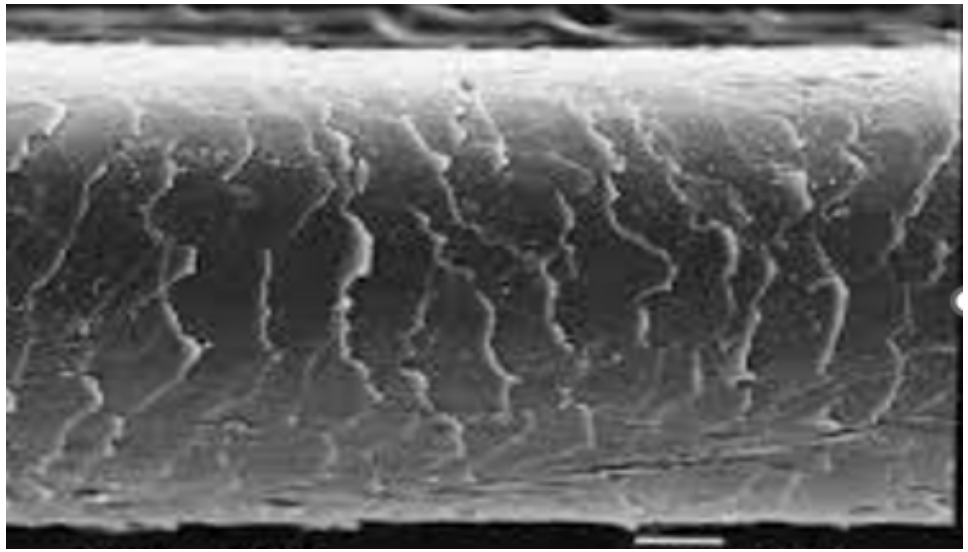
Distribution of **EtG** levels



- Results above or below EtG Cut-off depending on the site of collection
- EtG variance ranged from 2.5 to 7.5 fold differences

Influencing Factors - Hair Treatments

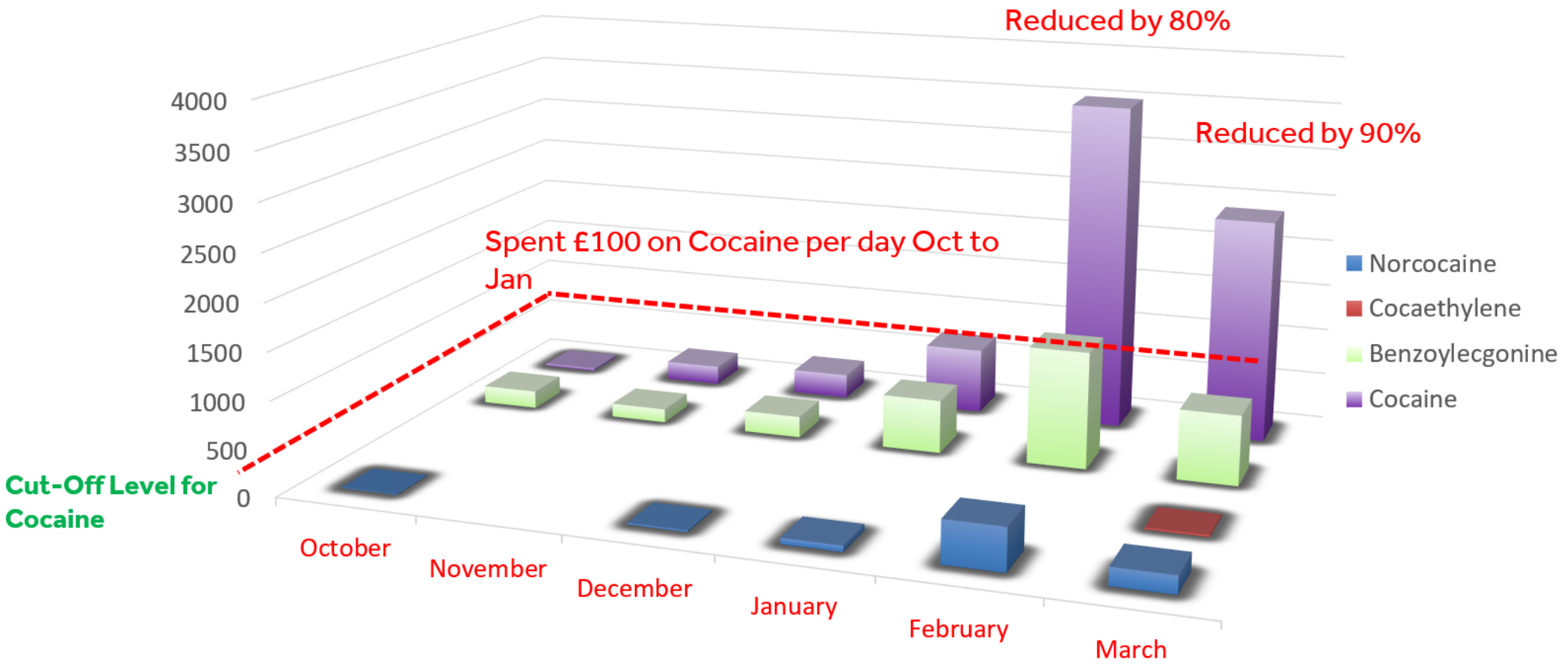
- Bleach and Permanent Hair Dye can remove up to ~80% of drug from hair in single application
- Testing for Melanin content and / or Oxidative markers can establish if hair is representative of drug / alcohol use



- Drugs transferred along the hair shaft
- Drug contamination absorbed into hair
- Thermal straightening hair converts Cocaine to AEME – compound which associated with ”Crack” Cocaine

Impact of Hair Dye and Thermal Treatment

Female user of cocaine, multiple use of permanent hair dye, daily straightening up to early February

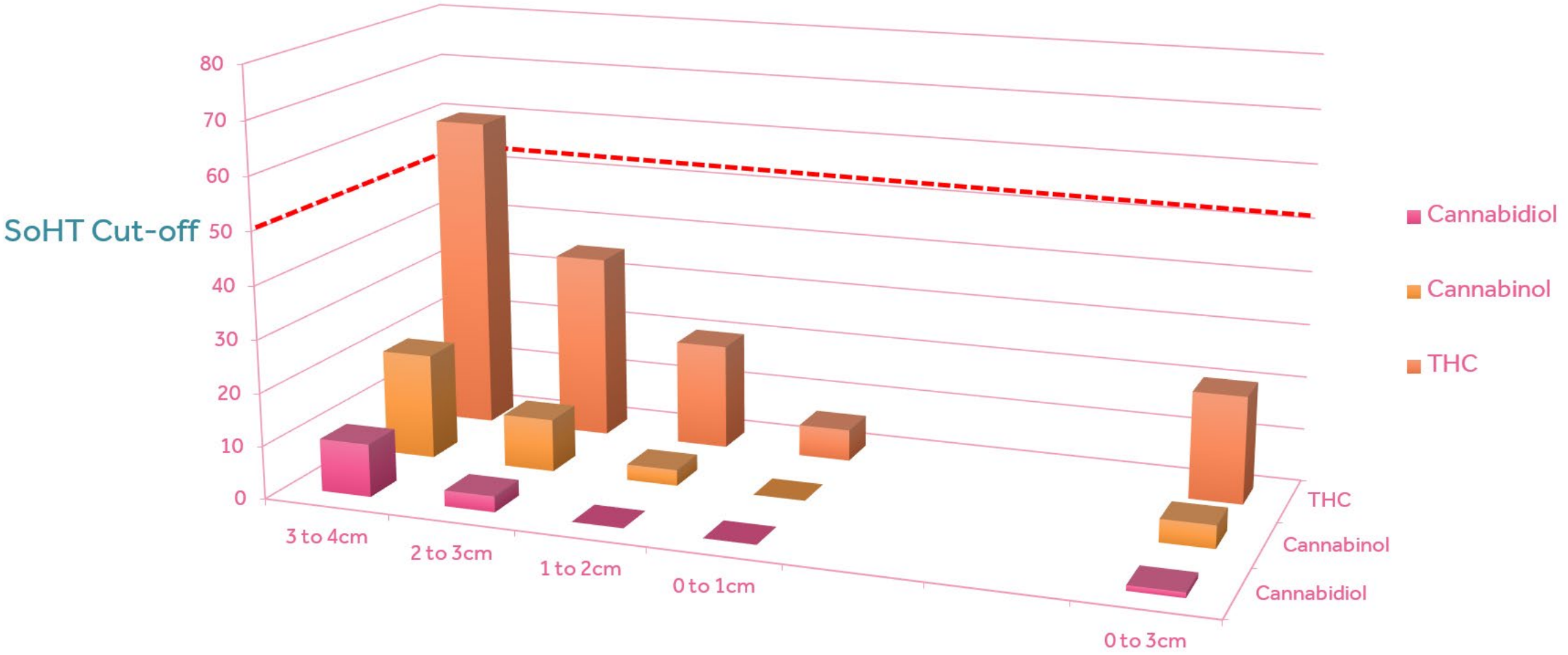


Chain of Evidence eg. Hair Collection Site

- Is the hair secure?
- Dye lines

- How much hair is left on the scalp
- Essential for correct periods

Cannabis testing – Regular user



Misreporting When Cut-offs used to Report

False reporting when applying **SoHT cut-offs** to results of ~3,000 FTS hair samples from cases with known and/or supported outcomes

	Cut-off Test Result	Interpretation
• ~12% hair samples in cases '**not**' using Heroin	**'Positive'**	**Drug use (Chronic)**
• ~18% hair samples in cases '**not**' using Cocaine	**'Positive'**	**Drug use (Chronic)**
• ~22% hair samples from chronic Heroin users	**'Negative'**	**No use (Exposure)**
• ~20% hair samples from chronic Cocaine users	**'Negative'**	**No use (Exposure)**
• ~60% hair samples from chronic Cannabis users	**'Negative'**	**No use (Exposure)**

T.I.A.F.T. 2019 - Guidance on Reporting HST

Professor A. Robert W. Forrest presented a paper;
'Hair Strand Analysis Evidence in Court' which concluded:

"Toxicologists reporting hair strand analysis results should move away from simply providing results by the application of cut-offs, to a process of assisting the Courts as experts by providing data supported, evidence-based opinions."

For Reliable Expert Opinion Evidence

- This is **opinion evidence** so **instruct an expert** at the outset
- Part 25, letter of instruction
- Provide the expert with case specific context, history and the questions / issues that need to be addressed
- Expert will collect full range of samples and determine samples and tests required
- Update the expert on new information post instruction as required
- Insist on full forensic investigation process, with comprehensive chain of evidence
- Full statement to be taken from the client to establish prevailing context and influencing factors that will likely impact the findings from the testing

Balanced Evidence Supports Decision Making

- When presenting evidence, expert opinions must be balanced, **not** binary
  - More likely than not – Very likely – Extremely likely (the probability)
  - More likely opinion balanced with possible, but less likely explanation[s]
  - Equally likely scenarios providing 2 or 3 possible explanations
- In cases where evidence is inconclusive, guidance should be provided
  - Recommendations given on further testing and investigation required to enable a final opinion to be provided that achieves ‘on the balance of probabilities’
  - An assessment of the likelihood of the recommended work achieving an opinion that is ‘more likely than not’
  - Alternatively, is the proposed work likely to strengthen the evidence (i.e. increase probability) so informed decisions can be made by the court

Discussion

Thank you

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