



Updated versions of the following documents are available in January 2020:

- Recommendations for the collection of forensic specimens
- Recommendations the Evidence
- Forensic medical examination form

Please also note that the following documents were published in November 2019:

- Operational procedures and equipment for clinical facilities in SARCS
- Operational procedures and equipment for clinical rooms in police stations.

Forensic Medical Examination Form

The form has been amended to include a space for recording the number on the Tamper Evident Bag (TEB). It is essential that this form is completed by the examining HCP, exhibited, and given to the police officer with the samples. Many organisations have an in-house version of the form and the same applies. The form is essential for the forensic scientists to be able to interpret the results.

The House of Lords Science and Technology Select Committee Report: Forensic Science and the Criminal Justice System: A Blueprint for Change

The Government has responded (see link below) recommending that the Forensic Science Regulator's remit and resources be reformed and expanded to include responsibility for regulating the market.

Forensic Science and the Criminal Justice System: A Blueprint for Change

Blood samples for toxicology (Road traffic and General toxicology cases)

Unfortunately blood samples are arriving at the laboratories and the glass vials are broken. It is essential not to overfill the sample bottle. The current recommendations state:

Approximately 7.5 ml into 10ml/2x5ml tubes (no more than ¾ full, preferably glass).

The breakage is likely a result of expansion after freezing but cushioning of the bottle is important too. Please remember to

put the foam piece/cotton wool into the plastic container that the blood sample goes into.

Questions to the FSSC

The FSSC considers questions sent in by members of the FFLM and other interested parties. Here are the questions with answers from the last six months:

1. A detainee blew 94 at the roadside. She came into custody with a large pile of paperwork stating that she had liver problems and was in ketosis, therefore the breathalyser was picking up the ketosis and she had not drunk alcohol. She was known to be alcohol dependent with previous convictions for drink drive offences. She was then put on the evidential breath machine and blew 93. The officers asked for a blood sample due to her excuse of ketosis.

We obtained advice from Dr Paul Williams, Forensic Science Consultant:

All the roadside breath test devices used by the police in the UK are insensitive to ketones, so this detainee's initial reading of 94 had to be due to alcohol. The evidential breath machine used has four channels of infrared for ethanol measurement and specificity. It will register the message 'Interfering Substance' if the ethanol reading is elevated by more than about 2ug due to the presence of some non-ethanolic substance in the breath. This is a requirement of Home Office Type Approval. Further, as the evidential breath machine's ethanol measurement channel is about 20 times more sensitive to ethanol than it is to acetone anyway, it means that in the absence of ethanol [as per her claim] to score the 93 she did through undetected acetone would require a breath acetone level of around 2000ug/100ml [i.e. 20 x 93]. This would require a **blood** acetone level of around 650mg/100ml – some ketosis!

The detainee's readings are therefore of course completely 'inconsistent' with her claim that she had not consumed alcohol.

2. How soon should volunteer (Elimination) DNA samples in sexual assault cases be destroyed, when provided by a self-referral patient at a SARC?

The FFLM has discussed with, and sought advice from, a number of colleagues including forensic scientists, the Forensic Science Regulator and the Biometrics Commissioner, as well as considering the requirements of the Protection of Freedoms Act (PoFA), 2012. However, the following is not to be construed as legal advice, and colleagues may wish to seek their own – including legal – advice.



Looking at the wording of section 14 of PoFA/section 63R of PACE it appears that the situation as above is not covered by the provision requiring DNA samples to be destroyed within 6 months of being taken. The section applies to samples either taken under PACE powers (which does not appear to apply here) or taken by the police, with the consent of the person, in connection with the investigation of an offence by the police. If the person self-refers and has not yet reported to the matter to the police it would be a real push to construe the sample as having been taken by the police (or on their behalf by staff at the SARC). Further, if an offence has not been reported, the sample does not appear to be being taken in connection with the investigation of an offence by the police. This situation would not change if the offence were subsequently reported to the police, as this applies only at the time when the sample was taken.

Given the above, it does not seem that the 6 month PoFA time limit should apply to elimination samples taken by SARCs as a result of a self-referral, at a time when no report of an offence has been made to the police. Having said that, once the sample enters the criminal justice system (i.e. the person reports the offence and the sample is passed to the forensic science provider (FSP) for processing), it would seem sensible to at least respect the spirit of PoFA, even though it does not strictly appear to apply. In which case the sample should usually be destroyed after the profile is derived unless there is a specific reason for not doing so that can be justified under the Criminal Procedure and Investigation Act (CPIA), 1996 exemption. Retained samples should then be monitored in the usual way and destroyed when they are no longer required.

Advice with regard to hair samples for toxicology – Fiona Perry

The current FFLM Recommendations state that hair samples should be considered:

- If the incident occurred up to 6 months prior to the examination and there is a possibility that drugs may have been eliminated from the urine (drugs are eliminated from urine at rates varying from 12 hours to over 3 weeks).

Use a specific kit where possible from a specialist laboratory or see the FFLM guidance: [Recommendations for Collecting Hair Samples for Toxicology](#).

It is recommended in relation to hair sampling to:

- a. Use a suitably accredited laboratory (check that their accreditation covers hair analysis and all the drugs that you require testing for).
- b. Check that the laboratory follows the recommendations published by the Society of Hair Testing (www.soht.org). The 'Statements' and 'Consensus' on this website

contain useful guidelines for testing for drugs, alcohol markers and doping agents in a variety of applications and investigation types, including guidance on sample collection, sample preparation and analysis, analytical method sensitivity and cut-offs and quality assurance (including proficiency testing).

- c. Obtain a full report with interpretation of the results, taking into account any circumstances relevant to the case e.g. any limitations to the analysis/hair sample, potential surface contamination of the hair by environmental or home environment etc.

Here are some examples of how hair samples may assist:

Example 1: demonstrates past drug use when blood testing is negative

Child taken to hospital due to concerns for his welfare:

- Found to have several recent and old injuries.
- Parents deny abuse (or recent drug use, mother admits past cannabis use).

Blood samples taken from parents about 17 hours after police called:

- No urine taken.
- Tests for drugs of abuse on blood negative.

Hair samples taken from parents:

- Father (3 sections, 0 to 6 cm): occasional cocaine use/exposure.
- Mother (3 sections, 0 to 6 cm): cannabis use (suggests more recent than admitted).

Example 2: demonstrates investigation of explanation provided by suspect

Child taken to hospital with a suspected overdose (unconscious).

- Parents stated that the child had 'accidentally' got hold of their antidepressant medication.

Blood and urine taken in hospital:

- Positive for amitriptyline (and metabolite nortriptyline).

Hair sample:

- Positive for amitriptyline and nortriptyline in 3 sections (3 x 1cm sections)
- High concentrations suggesting administration/ingestion on more than one occasion.



Example 3: demonstrates how the 'pattern' of drugs in the hair can provide information on the likely source and whether or not it could be due to surface contamination

Police called by Emergency Services as they were dealing with a 'heavily intoxicated' female:

- Concerns raised about the welfare of a 2-year-old child present in the house.
- Mother admitted buying drugs off the internet to help her sleep.

Hair sample taken from the child approximately 2 months later (3 sections analysed, 0 to 9 cm):

- Cocaine (low) plus other metabolites including norcocaine in all 3 sections. Suggests at least some ingestion but not necessarily deliberate (could be from environment or household due to touching contaminated surfaces (including clothing/ hair, passive inhalation etc.).
- Cannabis: THC in all 3 sections (plus washes) but no metabolite (carboxy-THC). Suggests environmental contamination most likely.
- Diazepam (low) and alprazolam in all 3 sections. Suggests repeated exposure to alprazolam and possibly occasional exposure to diazepam (although low concentration of diazepam could also be from external contamination).

All concentrations highest in 3rd section and lowest in 1st section. Decreasing pattern.

Example 4: demonstrates usefulness in a DFSA case when there has been a significant time interval prior to urine collection.

Adult female believed that her drink had been "spiked" on a night out:

- Reported to police 2 days later.
- Urine sample taken approximately 2½ days after the alleged incident (negative).
- Denied drugs of abuse use.

Hair sample taken about 6 weeks after the alleged incident (3 sections analysed for sedatives/DOA and alleged incident should correspond to 1st section).

Results:

- antidepressant drug in all 3 sections (prescribed)
- GHB (8 sections): 0.8 to 1.4ng/mg (endogenous)
- Cocaine and ketamine (low) in 3rd section (4 to 6cm i.e. at least several weeks prior to incident), very low ketamine in 2 earlier sections also but hair sample described as badly aligned.

Example 5: demonstrates how using both blood and hair analysis can provide a more detailed picture of past drug use

Male arrested for murder:

- Blood sample taken 27 hours after incident (no urine).
- Hair sample taken around the same time.
- Stated he was prescribed diazepam (but not taken it for 2 days), co-codamol, a sleeping tablet and an antidepressant. Previously prescribed an anti-psychotic.
- Admitted cannabis use.

Blood analysis

- Diazepam and metabolites detected (therapeutic level).
- Very low level of cocaine metabolite (benzoylecgonine).
- No cannabis (could be eliminated - no evidence of chronic use).
- No anti-depressant detected (possibly eliminated, depending on dose?).
- No tests carried out for anti-psychotic medication.

Hair analysis (3 segments (0-7cm))

Suggests:

- Regular cocaine use (in all 3 sections)
- Occasional use of other stimulants (e.g. MDMA) plus ketamine
- Occasional cannabis use (low in 2 most recent sections)
- Repeated codeine, diazepam and sleeping tablet use (as expected)
- Occasional tramadol use
- Confirmed repeated antidepressant use (plus several others!)
- Confirmed anti-psychotic use (higher in 2 older sections), plus another antipsychotic.



The interpretation of findings relating to intimate swabs – Rachel Morgan

When the Police submit intimate samples to a Forensic Service Provider in relation to a sexual offence case they usually want to know if semen or other biological material is present, and whether this finding supports the view that a certain activity (e.g. vaginal intercourse) has taken place. Often a forensic scientist will have to consider two alternative propositions (e.g. vaginal intercourse with ejaculation in to the vagina vs. non-penetrative activity with external ejaculation) and determine if the findings provide support for one scenario over the other.

In order to fully evaluate findings from intimate swabs a forensic scientist will consider the nature of any material present, the amount of material/DNA detected and the distribution of material/DNA between the different areas sampled. Information from the medical examination, such as the order in which samples are taken and whether a speculum and/or proctoscope is used, will assist the scientist in determining expectations from the examinations. The use of a speculum or proctoscope will ensure high vaginal/ endocervical swabs or rectal swabs do not contact external or lower vaginal/anal tract areas during sampling, thus it may be possible to address whether vaginal or anal penetration has occurred. If the FFLM recommendations for sampling are followed, then this will minimise the transfer of material from one sample area to another and help ensure the forensic scientist's interpretation is robust. If it is not feasible to follow the recommendations then documenting this clearly, and giving reasons why, will assist the scientist.

After semen/DNA is deposited in the vagina/anus it will begin to degrade and be lost through actions such as washing and drainage. Consequently, as the time since intercourse (TSI) increases the amount of semen in the vagina/anus will decrease. Furthermore, different components within semen will be lost/degrade at different rates. Therefore, by evaluating the levels of semen present and the presence/absence of different components of semen, it may be possible to address when sexual intercourse is more likely to have occurred. Therefore, even if two scenarios are presented to the scientist which involve the same/similar activities but are alleged to have occurred at different times (as often occurs with a domestic incident) the examination of intimate swabs may still assist in the investigation.

On occasion an allegation may be made in which semen (or other material) is deposited on a specific area of the external genitalia, such as the external vulva or within/between labia, however sampling such distinct areas separately is unlikely to assist the scientist's interpretation of the findings. Due to the proximity of these areas any material present on one area of the external genitals will, over time, be redistributed to other external areas by actions such as drainage, wiping and contact with underwear. Therefore, sampling multiple external genital areas separately will not assist the scientist in determining which specific area any material was originally deposited. Consequently, when recovering material from the external genital area it is advised that the FFLM recommendations for areas sampled are adhered rather than subdividing into smaller distinct areas, for example, labia and posterior fourchette.

HO/RT 5 Certificates

There have been a number of different versions of this certificate produced in recent years and the FFLM has been asked if this is acceptable.

There is no national template so individuals/companies/police forces can develop their own version as long as it is clear it's a Certificate relating to Sec 16(2) Road Traffic Offenders Act 1988 and covers the relevant elements as below:

16(2) Subject to subsections (3) and (4) below, evidence that a specimen of blood was taken from the accused with his consent by a medical practitioner or a registered health care professional may be given by the production of a document purporting to certify that fact and to be signed by a medical practitioner or a registered health care professional.