

## Are We Contaminating Victims in Sexual Assault Referral Centres?

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### Abstract

DNA testing technology has rapidly advanced and is now so sensitive that it brings with it a risk of contamination, which could potentially lead to a miscarriage of justice. I reviewed environmental monitoring data from six SARCS (Sexual Assault Referral Centres) in the UK between 2013 and 2015 to assess contamination levels in the UK in line with new guidelines produced by the Forensic Regulator for the UK.

**Keywords:** Sexual assault; DNA testing technology; Forensic DNA analysis

### Introduction

Forensic DNA analysis is a relatively new field, first developed in 1985, by Sir Alec Jeffreys, a professor of Genetics at Leicester University. DNA profiling was then implemented worldwide using amplification by polymerase chain reaction (PCR) and repeating sequences variable number tandem repeats (VNTR). In the 1990s VNTRs were replaced with short tandem repeats (STR) and by the year 2000, the first commercial kits became available for forensic DNA analysis. DNA profiles record the variation at a defined number of locations [loci] in the person's DNA [1]. DNA 17 is one of the latest DNA profiling technologies based on 16 STR loci and a gender identifier. However this rapidly developing field and DNA 24 is now used in Scotland. The advantages of this technology are that it allows improved discrimination between profiles, thereby greatly reducing the probability of getting a chance match between 2 unrelated individual's DNA profiles. The disadvantage of such sensitive technology is the possibility of contamination.

### Aim

To review the environmental monitoring data from 6 SARCS (Sexual Assault Referral Centres) in the UK between 2013 to 2015.

### Method

I was the Clinical Director of g4s Forensic and Medical Services from 2013 to 2015, so i was well placed to access data on environmental monitoring from the six SARCS, which we managed in the UK. These included SARCS in Essex, West Mercia (2 SARCS, Worcester and Telford), West Midlands (2 SARCS-Walsall and Castlevale) and Dorset.

I consulted the UK guidelines from the FFLM (Faculty of Forensic and Legal Medicine) on the collection of forensic samples [2]. These guidelines say that "reasonable steps must be taken to reduce contamination including the use of double non-sterile gloves throughout the sampling process." At the time of my study, between 2013 to 2015, there was no consistent uniform policy in the UK for SARCS, some suggested wearing scrubs, bare from the elbow down, others advocated paper gowns or just a plastic apron [3]. I also consulted SANEs (Sexual Assault Nurse Examiners) in the USA on their uniform policy.

My study required an overview of SARC cleaning processes and it became apparent that SARCS in the UK had no consistent cleaning policy in some SARCS, private cleaning companies were contracted by the Police to clean the SARC, in others, the Crisis workers, who are employed by the SARC to support the victim were also trained to clean the examination room to forensic standards [4-7]. In all the SARCS, i studied, the examination room was also deep cleaned every 3 to 6 months following the completion of environmental monitoring, when

areas of the SARC were randomly sampled for DNA. I reviewed this environmental monitoring data from the six SARCS.

### Results

Environmental monitoring categories were reported as follows (Table 1).

Background: Background contamination-No further action but need to monitor long term trends.

Level 1 contamination: Clean affected area and resample.

Level 2 contamination: Close off room, deep clean and re-sample all areas.

However some laboratories were just reporting the contamination as Pass, Caution or Fail.

### SARC 1: Essex, cleaned by private cleaning company, financed by police (2 examination rooms)

2013. 9 Areas of SARC randomly sampled and background levels of DNA were found on the examination light and the edge of the examination couch. 1 Level 1 contamination was found on the desk top.

2014. 11 areas of SARC sampled and background levels of DNA were found in the sample storage box, the height measure and the couch. Level 1 contamination was found on the soft chair in the waiting room and on the surface inside the stock cupboard. Level 2 contamination

	LEVEL 1	LEVEL 2
SARC 1	3	1
SARC 2	1	2
SARC 3and 4		
SARC 5	1	2
SARC 6	5	4

Clear-no contamination. No further action required

Table 1: Environmental monitoring categories.

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was found on the TV remote control in the waiting area-this resulted in the whole SARC suite being closed down and unavailable to victims until it could be deep cleaned.

#### **SARC 2: Walsall, cleaned by SARC crisis workers (2 examination rooms)**

2013. 5 areas of SARC examination room randomly sampled and 1 Level 1 contamination found on the sink.

2014. 8 areas of SARC randomly sampled and 2 Level 2 contaminations found on different areas of the examination couch, resulting in the whole SARC being closed down until deep cleaning could be carried out.

2015. 7 areas of SARC randomly sampled and no contamination found.

#### **SARC 3: Castlevale, cleaned by SARC crisis workers (1 examination rooms)**

2013. 4 areas of SARC randomly sampled-no contamination.

2014. 3 areas of SARC randomly sampled-no contamination.

2015. 4 areas of SARC randomly sampled-no contamination.

#### **SARC 4: Telford, cleaned by SARC crisis workers (1 examination rooms)**

2013. 6 areas of SARC randomly sampled-no contamination

2014. 4 areas of SARC randomly sampled-no contamination

#### **SARC 5: Worcester, cleaned by SARC crisis workers (2 examination rooms)**

2013, 13 areas of SARC randomly sampled and 1 level 1 contamination found on Colposcope (equipment used for photo documentation) and 2 level 2 contaminations found on the worktop. 1 examination room had to be closed down until deep cleaning could be carried out.

2014. 6 areas of SARC randomly sampled and no contamination reported.

#### **SARC 6: Dorset, cleaned by SARC crisis workers, (2 examination rooms)**

2013. 10 areas of SARC randomly sampled and 3 level 1 contaminations were found on the couch, door handle and worktop

2014. 8 areas of SARC randomly sampled and no contamination found.

2015 [February]. 12 areas of SARC randomly sampled and 2 level 1 contaminations found on worktop and couch and 2 level 2 contaminations found on sink and showers room. Due to these failures, repeat environmental monitoring was carried out.

2015 [August]. 14 areas of SARC randomly sampled and 2 level 2 contaminations were still found on the couch and toilet. This resulted in rigorous re-enforcement of the cleaning regime

### **Interpretation of Data and Discussion**

The environmental monitoring data revealed 10 Level 1 and 9 Level 2 contamination incidents. The results do show that SARCs which had only one examination room such as Castlevale and Telford had lower rates of contamination and this probably reflects the fact that they were

not nearly as busy with a much lower throughput of victims than those larger SARCs with 2 examination rooms. Both SARCs cleaned by private cleaning companies and SARCs cleaned by crisis workers showed levels of contamination, so there was no evidence that crisis workers performed less well at cleaning than the private cleaning company. The laboratories were reporting contamination differently, which made it difficult to interpret the data, but whichever terminology was used, there was a level of contamination found. There was also inconsistency in the number of swabs taken for environmental monitoring purposes [8-10].

I looked at where in the SARC contamination was found and what impact this could have. In SARC-1, a level 2 contamination was found on the TV remote control in the forensic waiting room and even this could potentially contaminate the victim prior to the examination. Higher risks of contamination were also apparent as the desktop, examination couch, worktop where samples were bagged up and the colposcope in the examination room were found to be contaminated and could potentially have led to a miscarriage of justice.

The results from environmental monitoring do show that SARCs in the UK should learn to clean more thoroughly, with the correct and recommended cleaning materials but there should also be consistent use of protective clothing by doctors, nurses and crisis workers to reduce contamination. Even biros taken into the examination room could be a potential source of contamination. SANEs (Sexual Assault Nurse Examiners) consulted in the USA, informed me that they wore scrubs with scrub jackets to cover the bare forearms whereas Nurses in the UK were often wearing scrubs only, which were bare from the elbow down and therefore a potential source of contamination. SANEs were also using face masks during the genital examination and forensic sampling.

New guidelines on DNA anti contamination measures in SARCs have been produced in 2016 by the Forensic Regulator in the UK, which aim to minimise the inadvertent transfer of DNA material during an examination [2]. The forensic regulator has recommended that SARC staff do not have contact with multiple individuals linked to the same crime and there should be a reduction in the number of people present in the examination room. They recommend just a nurse or doctor and a crisis worker but no Police Officer. They suggest an increased frequency of deep cleaning from 3 monthly to monthly. Disposable clothing such as scrubs should be worn with disposable sleeve covers and a double gloving technique. They also recommend face masks and hair nets, however there is a careful balance to strike here with Forensic needs versus Victim needs as victims may unfortunately see themselves as "dirty and contaminated by the rapist" and however much we reassure the victims that the protective clothing is to stop us contaminating the forensic samples, they may think "they are dirty and we are protecting ourselves against contamination by them" [11,12].

There has already been a reported case in the UK, where contamination occurred in unrelated complainants who attended the same SARC, which came to the notice of the Forensic Regulator. A vaginal sample from complainant B was found to have DNA from complainant A. An investigation found the mode of contamination to be uncertain but possible causes were cited as multiple use biros and Police officers present in the examination room with no protective clothing. The reported contamination which led to the SARC being closed down for many months.

### **Conclusion**

My review of the environmental monitoring data has shown that

contamination in SARCS is a very real and important issue in the UK and all SARCs must adhere to guidelines and ensure compliance with protective clothing and cleaning processes.

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