Recommendations for the collection of forensic specimens from complainants and suspects – the evidence

**Toxicology samples  
(blood, urine and hair)**

**General advice**
Some drugs can adhere or ‘stick’ to plastic and therefore glass tubes are recommended for toxicological samples.

**Drug-facilitated crime**
UNODC. (2011) Guidelines for the forensic analysis of drug facilitating sexual assault and other criminal acts
Accessed 24/11/2015

**Detection times for drugs**
Moffat AC., Osselton MD., Widdop B. & Watts J. Eds. Clarke’s Analysis of Drugs and Poisons. 4th ed

Baselt RC. Disposition of Toxic Drugs and Chemicals in Man, 11th ed
Biomedical Publications, Seal Beach, CA, 2017

**Urine collection up to 14 days in DFSA cases**
Negrusz A., Moore C., Stockham TL., & Levy NA. Elimination of 7-Aminoflunitrazepam and Flunitrazepam in urine after a Single Dose of Rohypnol®

**Biological Samples**

**Double gloving with changing of gloves with different body areas**
Margiotta, G., Tasselli, G., Tommolini, F., Lancia, M., Massetti S., Carnevali, E. Risk of DNA transfer by gloves in forensic case work.
Forensic Science International: Genetics Supplement Series 2015: 5; e527-e529
(It is imperative to change gloves every time after touching items or surfaces, prior to touching the exhibit. It is desirable to wear multiple layers of gloves to avoid skin exposure during the changing of gloves.)

**Double swabbing**
Sweet , D., Lorente, M., Valenzuela, A., Vilanueva, E. An improved method to recover saliva for human skin: the double swab technique
(Use of the double swab technique increased the recovery of saliva from human skin and therefore DNA evidence.)

Pang, BCM., & Cheung, BKK. Double swab technique for collecting touched evidence
Legal Medicine 2007: 9; 181-184
(The double swab technique improves the quality of the resulting DNA profiles.)

**Oral samples**
Allard, J. E. The collection of data from findings in cases of sexual assault and the significance of spermatozoa on vaginal, anal and oral swabs
Sci. Justice 1997: 37; 99- 108 (maximum persistence of sperm in the oral cavity recorded as 28-31 hours)

Nittis M., Franco M., Cochrane C. New oral cut-off time limits in NSW
Journal of Forensic and Legal Medicine 2016: 44; 92-97
(oral rinse and perioral (lip) swab recommended in cases of oral assault)

**Saliva on skin**
Kenna J., Smyth M., McKenna L., Dockery C. & McDermott SD. The recovery and persistence of salivary DNA on Human Skin
J Forensic Sci. 2011: 56; 1; 170-175
(showed persistence of salivary DNA up to 96 hours when not washed in 3 volunteers with saliva on their legs)

**Hair**
Salter, M.T., Cook, R. Transfer of fibres to head hair, their persistence and retrieval
Forensic Science International 1996: 81; 2; 211-221
(hair style and activity are major factors in affecting persistence; taping is more efficient than combing)

Exline, D.L., Smith, F.P ., Drexler, S.G. Frequency of pubic hair transfer during sexual intercourse
J Forensic Sci: 1998; 43; 505-508
(important to collect pubic hair combings from the male suspects as well as from female victims, provided the time interval is not extreme)

Toxicology samples  
(blood, urine and hair)

General advice
Some drugs can adhere or ‘stick’ to plastic and therefore glass tubes are recommended for toxicological samples.

**Drug-facilitated crime**
UNODC. (2011) Guidelines for the forensic analysis of drug facilitating sexual assault and other criminal acts
Accessed 24/11/2015

**Detection times for drugs**
Moffat AC., Osselton MD., Widdop B. & Watts J. Eds. Clarke’s Analysis of Drugs and Poisons. 4th ed

Baselt RC. Disposition of Toxic Drugs and Chemicals in Man, 11th ed
Biomedical Publications, Seal Beach, CA, 2017

**Urine collection up to 14 days in DFSA cases**
Negrusz A., Moore C., Stockham TL., & Levy NA. Elimination of 7-Aminoflunitrazepam and Flunitrazepam in urine after a Single Dose of Rohypnol®

**Biological Samples**

**Double gloving with changing of gloves with different body areas**
Margiotta, G., Tasselli, G., Tommolini, F., Lancia, M., Massetti S., Carnevali, E. Risk of DNA transfer by gloves in forensic case work.
Forensic Science International: Genetics Supplement Series 2015: 5; e527-e529
(It is imperative to change gloves every time after touching items or surfaces, prior to touching the exhibit. It is desirable to wear multiple layers of gloves to avoid skin exposure during the changing of gloves.)

**Double swabbing**
Sweet , D., Lorente, M., Valenzuela, A., Vilanueva, E. An improved method to recover saliva for human skin: the double swab technique
(Use of the double swab technique increased the recovery of saliva from human skin and therefore DNA evidence.)

Pang, BCM., & Cheung, BKK. Double swab technique for collecting touched evidence
Legal Medicine 2007: 9; 181-184
(The double swab technique improves the quality of the resulting DNA profiles.)

**Oral samples**
Allard, J. E. The collection of data from findings in cases of sexual assault and the significance of spermatozoa on vaginal, anal and oral swabs
Sci. Justice 1997: 37; 99- 108 (maximum persistence of sperm in the oral cavity recorded as 28-31 hours)

Nittis M., Franco M., Cochrane C. New oral cut-off time limits in NSW
Journal of Forensic and Legal Medicine 2016: 44; 92-97
(oral rinse and perioral (lip) swab recommended in cases of oral assault)

**Saliva on skin**
Kenna J., Smyth M., McKenna L., Dockery C. & McDermott SD. The recovery and persistence of salivary DNA on Human Skin
J Forensic Sci. 2011: 56; 1; 170-175
(showed persistence of salivary DNA up to 96 hours when not washed in 3 volunteers with saliva on their legs)

**Hair**
Salter, M.T., Cook, R. Transfer of fibres to head hair, their persistence and retrieval
Forensic Science International 1996: 81; 2; 211-221
(hair style and activity are major factors in affecting persistence; taping is more efficient than combing)

Exline, D.L., Smith, F.P ., Drexler, S.G. Frequency of pubic hair transfer during sexual intercourse
J Forensic Sci: 1998; 43; 505-508
(important to collect pubic hair combings from the male suspects as well as from female victims, provided the time interval is not extreme)
Fingernail swabbing
Dowlman EA., Martin NC., Foy Mj., Lochner T. & Neocleous T. The prevalence of mixed DNA profiles on fingernails swabs Sci. Justice 2010: 50; 64-71 (looking at the persistence of DNA profiles after intimate contact)
Flanagan N. & McAlister C. The transfer and persistence of DNA under the fingernails following digital penetration of the vagina For Sci International: Genetics 2011: 5; 479-483 (DNA profiles maybe obtained up to 18 hours post digital penetration)
Oz C. & Zamir A. An Evaluation of the Relevance of Routine DNA Typing of Fingernail Clippings for Forensic Casework Journal of Forensic Science 2000: 45(1):158-160 (clippings from 6 volunteers did not reveal donor profile – hence swabbing might be more effective)
Lederer, T., Betz P. & Seidl S. DNA analysis of fingernail debris using different multiplex systems: a case report Int J Legal Med 2001: 114(4-5): 263-6 (showed that a victim’s DNA might be accessed from fingernail scrapings from an assailant (using a small plastic spatula) two days after an assault and after the assailant had admitted to washing his hands several times)
Foran D., Hebdia L., Doran A. Trace DNA from Fingernails: Increasing the Success Rate of Widely Collected Forensic Evidence December 2015 Accessed 05/01/2016 (double swabbing of nails best in the living)

Female genitalia
Davies A. & Wilson E. The Persistence of Seminal Constituents in the Human Vagina Forensic Science 1974:3: 45-55 (spermatozoa found up to 3 days post intercourse and occasionally up to 6 days)
Astrup B.S., Thomsen J.L., Lauritsen J., Ravn P. Detection of spermatozoa following consensual sexual intercourse Forensic Science International 2012: 221; 137-141 (spermatozoa best recovered from the posterior fornix)
Mc Donald A., Jones E., Lewis J., & O’Rourke P. Y-STR analysis of digital and/or penile penetration cases with no detected spermatozoa Forensic Science International 2015; 15: 84-89 (the use of Y-STR profiling to provide scientific evidence to investigate whether the alleged sexual activity had occurred as well as to obtain probative evidence in spermatozoa negative penetration cases)
Hanson EK. & Ballantyne J. A Y-short tandem repeat specific DNA enhancement strategy to aid the analysis of late reported (≥ 6 days) sexual assault cases Med Sci Law 2014; 54: 4: 209-218 (semen donor Y-STR profiles found in post-coital samples collected 6-9 days after intercourse)
Sween, Kayla R., Quarino, Lawrence A., Kishbaugh, Janine M. Detection of Male DNA in the Vaginal Cavity After Digital Penetration Using Y-Chromosome Short Tandem Repeats Journal of Forensic Nursing 2015; 11: 1: 33–40 (viable possibility exists that probative Y-STR profiles can be obtained from vaginal swabs taken from subjects exposed to digital penetration at time intervals up to 72 hours post penetration)
Speck P. & Ballantyne J. Post-coital DNA Recovery Study NJJ, Washington, DC, March 2015 Accessed 21/12/2015 (provides strong pilot data to collect samples in females from the cervix and posterior fornix through their first menses for forensic laboratory analysis)
Ballantyne J. DNA Profiling of the Semen Donor in Extended Interval Post-Coital Samples NJJ, Washington DC, June 2012 Accessed 14/06/2016 (using a combination of novel methods to selectively enhance male DNA fractions the ability to obtain male donor profiles in extended interval post-coital samples collected 6 to 9 days after intercourse was demonstrated)
Paediatrics

Christian C., Lavelle J., Dejong A., Loiselle J., Brenner L. & Joffe M.
*Forensic Evidence Findings in Prepubertal Victims of Sexual Assault*
Pediatrics 2000: 106(1): 100-104
(medical records of 273 children under the age of 10 were reviewed. All children had forensic evidence collected within 44 hours of an alleged sexual assault. No swabs taken from the child’s body were positive for blood after 13 hours or sperm/semen after 9 hours)

Giardet R., Bolton K., Lahoti S., Mowbray H., Giardino A., Isaac R., Arnold W., Mead B & Paes N.
*Collection of Forensic Evidence from Paediatric victims of sexual assault 2011*
Paediatrics 2011: 128; 2
(body samples should be considered for children beyond 24 hours although the yield is limited)

Penile

Cina S.J., Collins K. A., Pettenati M. J. & Fitts M.
*Isolation and identification of female DNA on post-coital penile swabs*
Am. J. Forensic Med. Pathol. 2000: 21; 97–100
(female DNA profiles obtained on penile swabs up to 24 hours post coitus)

Farmen RKB., Haukeli I., Ruoff P., Froyland E.
*Assessing the presence of female DNA on post-coital penile swabs: Relevance to the investigation of sexual assault*
Journal of Forensic and Legal Medicine 2012: 19; 386-389
(female DNA was recovered on all post-coital penile swabs taken at 5-24 hours; volunteer study)

Anal

Wilson GM. & Allard JE.
*Spermatozoa – their persistence after sexual intercourse*
For Sci Int 1982: 19; 135-154
(maximum recorded interval between the act of anal intercourse and the identification on a rectal swab is 96 hours)

*Analysis of clinical forensic examination reports on sexual assault*
Int J Legal Med 2010: 124(3); 227-35
(found that only 7 anal swabs out of 37 (18.9%) were positive for sperm, when taken within 24 hours of assault)