SEXUAL ASSAULT EVIDENCE COLLECTION KIT EXAMINATION

2.1 PURPOSE

2.1.1 To inventory, prepare and preserve Sexual Assault Evidence Collection Kit evidence for Direct-to-DNA testing and/or retention for potential body fluid testing.

2.2 RESPONSIBILITY

2.2.1 Personnel qualified to perform Forensic Biology duties.

2.3 SAFETY

2.3.1 Use appropriate measures for the proper handling of biohazardous materials and chemicals according to GL-2 (Safety Manual).

2.4 DEFINITIONS/ABBREVIATIONS

2.4.1 SAECK: Sexual Assault Evidence Collection Kit. This can include a Connecticut issued, 'CT100' kit or an out-of-state kit.
2.4.2 Direct-to-DNA: The process of testing SAECK samples using either a non-differential or differential DNA extraction without serology or other screening methodology.
2.4.3 OCME: Office of the Chief Medical Examiner. During an autopsy, the OCME may submit a CT100 kit or other swabs if a sexual assault is suspected. For the purposes of this SOP, OCME SAECKs and non-kit swabs will be treated the same.
2.4.4 LIMS: Laboratory Information Management System.
2.4.5 CII = Case number, item number, initials
2.4.6 HLF: Hair-like fiber
2.4.7 NEATT: Not examined at this time
2.4.8 CNV: Contents not verified
2.4.9 RFA: Request for Analysis
2.4.10 BF: Body fluid

2.5 GENERAL NOTES

2.5.1 Refer to FB SOP-01 (Evidence Examination and Sample Collection Guidelines) for specific instructions on cleaning utensils/laboratory areas, personal protective equipment, evidence retrieval and for additional guidance on evidence examination including but not limited to documentation, collection, preservation, verification, sub-itemization, transfers/storage and LIMS.

2.5.2 At a minimum, the SAECK medical report(s) and kit packaging will be scanned and attached to case attachments in LIMS. The packaging scans will include the tracking barcode, and any relevant labels/seals. Physical copies of this documentation are not needed in the case jacket.

2.5.3 SAECK examination will be documented on FB QR-05b/05c (SAECK Worksheets)

2.5.4 Public Act No. 15-207

2.5.4.1 SAECKs and other evidence related to sexual assault cases that are submitted to the DSS will be handled according to Public Act No. 15-207 (An Act Concerning Evidence in Sexual Assault Cases).

2.5.4.2 SAECKs and other evidence related to sexual assault cases will be retained according to Public Act No.15-207 in a designated secure storage location at the appropriate temperature.

2.5.4.3 The following statement will be used to report out the disposition of SAECKs and other evidence related to sexual assault cases. For additional information see FB SOP-05 (Case Records and Reports): *Submission [ ] will be retained at the Laboratory per Public Act No. 15-207.*

2.6 EVIDENCE INVENTORY

2.6.1 A ‘CT100’ kit is typically comprised of the following components:

2.6.1.1 Known blood sample
2.6.1.2 Oral, Vaginal, Anal swabs & smears
2.6.1.3 Genital swabs
2.6.1.4 “Dried secretion” and “Touch” swabs
2.6.1.5 Fingernail swabs & clippings
2.6.1.6 Pubic hair combing
2.6.1.7 Debris collection
2.6.1.8 Other physical evidence (i.e. - clothing, condoms, sanitary pads.)

2.6.2 Unused envelopes/bags containing no collected sample, will remain unlabeled and un-itemized and will be placed back into the SAECK. These items may be marked with an ‘X’ or crossed-out on FB QR-05b.

2.6.3 All used envelopes/bags, even if no testing is to occur, will be labeled with CII and sub-itemized according to FB SOP-01 and GL-4.

2.6.4 Any relevant information on the envelopes/bags, such as collection location, will be noted on the QR. If inner labeling does not match the exterior envelope, additional or separate sub-itemization may be necessary.

2.7 EVIDENCE EXAMINATION

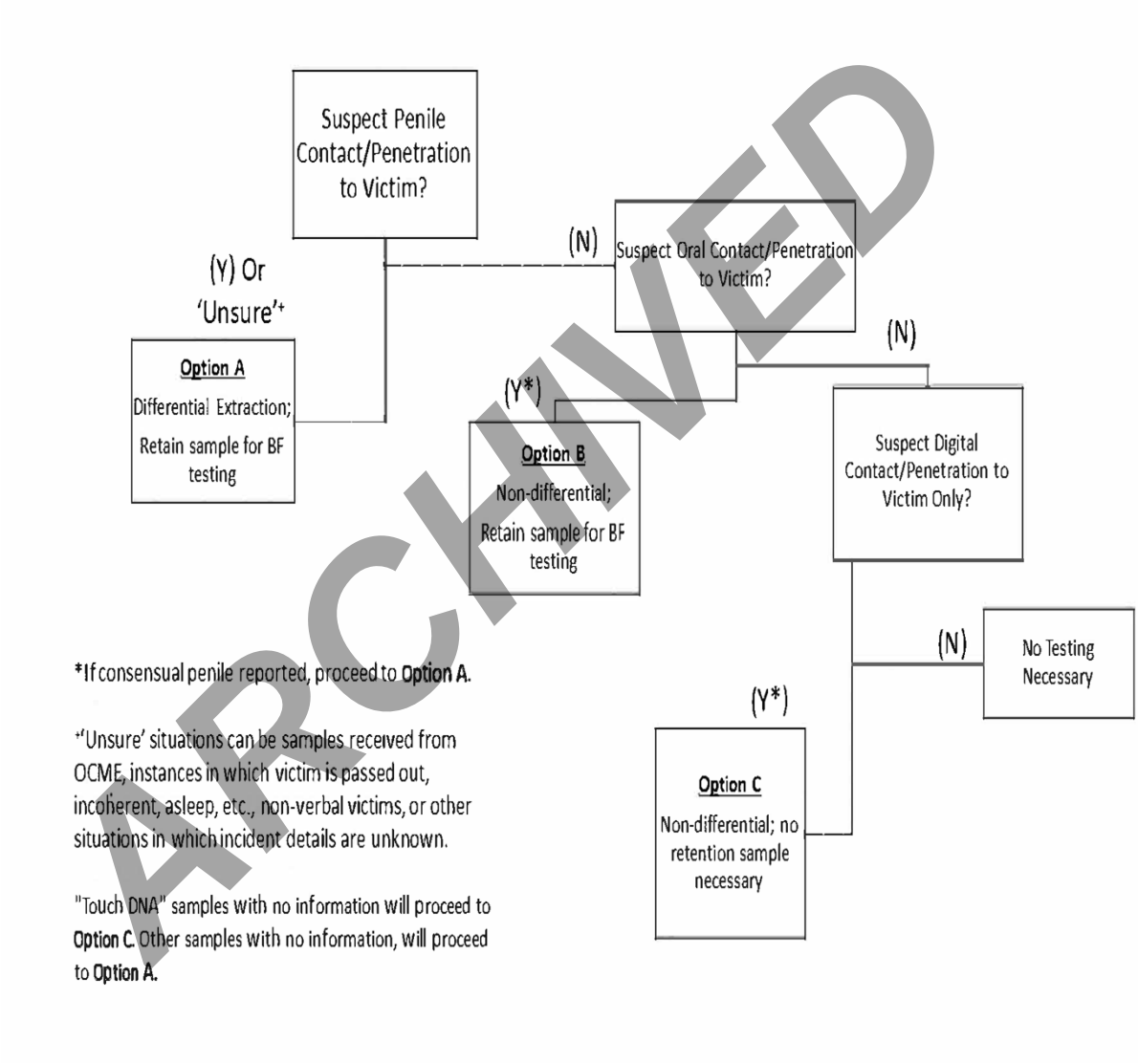
2.7.1 Case scenario will dictate the examination and testing of SAECK items. Case information will be evaluated from the medical report, RFA and/or any other case communications.

Additional factors to consider include, but are not limited to, victim age and/or mental capacity, number of suspects and other sexual encounters (i.e. – consensual).

2.7.2 The general workflow of whether to test a sample and what subsequent testing is selected, is indicated in Figure 1. Specific instructions are in 2.7.3 – 2.7.7.

Analysts may deviate from the workflow and/or instructions in 2.7.3 – 2.7.7 based on case scenario with Unit Manager approval.

Figure 1 – Evidence Examination Workflow



2.7.3 Known blood sample

2.7.3.1 Make and retain a blood stain from the purple top tube (PTT) according to FB SOP-07 (Whole Blood Sample Preservation). The blood tube will be returned to the SAECK.

2.7.3.2 If a Toxicology request has been made and no 'CT 400' kit has been collected, notify the Case Management and Toxicology Units.

2.7.3.2.1 If a red top tube (RTT) is present, make a blood stain from the RTT and refrigerate the PTT until it can be transferred to the Toxicology Unit.

2.7.3.2.2 If only a PTT is present, make a blood stain from the PTT and refrigerate the tube until it can be transferred to the Toxicology Unit.

2.7.3.3 If a 'CT 100' kit is submitted without a 'CT 400' kit, the medical paperwork and/or police report indicate possible drugging, and the known blood sample is collected within 24 hours of the incident, the below may be followed:

2.7.3.3.1 Once the blood stain is prepared, return the blood tube to the envelope and store in the designated refrigerator location.

2.7.3.3.2 Notify the Case Management Unit to obtain a victim consent form.

2.7.3.3.3 Upon receiving a consent form, the blood sample will be forwarded to the Toxicology Unit for analysis.

2.7.4 Orifice Samples: Vaginal, Oral, Anal and Genital

2.7.4.1 If no contact is indicated to a particular orifice, the orifice envelope will be labeled with CII and retained as NEATT/CNV in freezer storage.
Oral contact to the oral orifice is not a testable scenario.

2.7.4.2 If contact is indicated and the sample will be examined, the associated smear will be NEATT, sub-itemized, labeled with CII, and retained in freezer storage.

2.7.4.3 Swab count and appearance are documented on the QR.

2.7.4.4 Orifices with indicated penile contact and/or penile penetration, ***regardless of ejaculation or condom usage***, will be prepped and forwarded to DNA for a differential extraction (2.7.4.8).

2.7.4.5 For 'unsure' scenarios, all orifice samples will be prepped for differential extraction.

2.7.4.6 Locations with indicated oral and/or digital contact and/or penetration, will be prepped and forwarded to DNA for a non-differential extraction (2.7.4.8).

Exceptions to this are when **any** penile contact/penetration is also indicated (consensual or non-consensual). Samples collected from a victim's penis/genital area may also fall into this category. In these instances, the sample will proceed with differential extraction.

2.7.4.7 The genital swabs must be examined if either the vaginal or anal sample is examined.

2.7.4.8 Prepping swabs:

2.7.4.8.1 If semen and/or saliva are potentially present, a sample **must** be retained for possible body fluid testing.

2.7.4.8.2 A maximum of two swabs will be forwarded to DNA extraction.

2.7.4.8.3 Prepare the DNA and retained samples in a manner that ensures a sample from each carton/packet of the same location is taken and combined in accordance with FB SOP-01. The retained sample may be used for future serological testing.

Examples:

- Two cartons received, containing two swabs each; Prepare 2 swabs, 1 whole swab from each carton for DNA, and retain two swabs.
- Two total swabs received; Prepare ~1.5 swabs for DNA and retain ~0.5 swab.
- One swab is received; Prepare ~2/3 swabs for DNA and retain ~1/3.

2.7.4.8.4 If a sample is forwarded to DNA for digital contact only (no potential body fluid), a maximum of 2 swabs will still be utilized for DNA extraction.

2.7.4.8.5 Return kit envelopes to the kit.

2.7.4.9 If a known blood sample is not submitted, an oral swab may be used as a known DNA sample. This may occur only if no penile contact is indicated in the oral cavity. The oral swab cannot be used as a known in an 'unsure' scenario.
One (1) whole swab will be cut and prepped for DNA extraction.

2.7.5 Dried Secretion Specimen and "Touch DNA" swabs

2.7.5.1 Examine and prepare dried secretion and "Touch DNA" samples according to 2.7.4, with the below additional considerations.

2.7.5.2 Dried secretion swabs:

2.7.5.2.1 If a collection location is not clearly indicated, or the case scenario does not explicitly state why the sample was collected, prepare the sample as an 'unsure' scenario and proceed with a differential extraction.

Dried secretion swabs should typically have a portion retained for potential body fluid testing.

2.7.5.3 "Touch DNA" swabs:

2.7.5.3.1 Unless clearly indicated as containing a possible body fluid, no sample needs to be retained for future serological testing.

2.7.5.4 For most case scenarios, dried secretion and "Touch DNA" samples are typically not as probative as orifice and genital samples. Depending on the case scenario and number of samples received, Dried Secretion and "Touch DNA" samples are not required to be forwarded to DNA extraction on first round testing.

2.7.6 Unexamined evidence:

2.7.6.1 The following samples are not routinely examined:

- Smears
- Fingernail swabs & clippings– Specific case information regarding a struggle or scratching may warrant this examination.
- Pubic hair combings
- Debris collection/white examination sheet (WES)
- Other physical evidence – case by case basis. If examination necessary, refer to FB SOP-01.
- Any HLFs collected

2.7.6.2 All unexamined evidence will be sub-itemized, marked as NEATT and/or CNV on the QR and retained in the appropriate storage location.

2.7.6.3 When possible, items will be retained in their original packaging. Kit envelopes will be sealed and initialed when necessary. The WES should be placed in a separate, properly labeled and sealed envelope.

2.7.7 Forwarding samples to DNA:

2.7.7.1 Samples being forwarded for DNA extraction will be added to the designated spreadsheet and placed in the 'SA pending' rack in refrigerator storage.

2.7.7.2 Retained and/or consumption samples will be verified according to FB SOP-01.

2.8 SEROLOGY TESTING

2.8.1 Testing to identify specific body fluids on kit samples will occur at the request of the State's Attorney Office.

2.8.2 Retained samples will be retrieved from storage according to FB SOP-01 and GL-4. Samples may need to be further prepped to proceed with the serological testing.

2.8.3 Specific procedures for blood, semen and amylase testing can be found in FB SOP-08 (Screening Tests for Blood), SOP-12 (Screening Test for Semen), SOP-13 (Extraction of Samples for Semen), SOP-14 (Identification of Spermatozoa), SOP-15 (Rapid Immunoassay Test for Semen) and SOP-16 (Test for Amylase).

2.8.4 Smear Examination – Optional; case-by-case dependent.

2.8.4.1 Hospital-prepared smears may or may not be examined prior to the testing of the corresponding swabs.

2.8.4.2 Label the smear holder and smear(s) on the frosted edge of the slide in pencil with CII.

2.8.4.3 Conduct a preliminary, unstained search at 200X, placing the slide on a microscope stage with the frosted edge to the left.

2.8.4.3.1 Unstained smears can be used to observe red blood cells or unstained spermatozoa.

2.8.4.3.2 Record the observation of RBCs and/or spermatozoa, as well as the microscope(s) used, on the appropriate QR. A second, qualified examiner will confirm the identification and initial/date on QR.

2.8.4.3.3 Red blood cells are noted on the QR only if observed.

2.8.4.3.4 Spermatozoa (intact or head only) are recorded with the below rating. Ratings will not be confirmed.
4+ : numerous sperm in every field
3+ : a few sperm in every field
2+ : sperm not in every field but easy to locate
1+ : a few sperm (coordinates are needed to relocate)
1 spermatozoon – head portion or intact (coordinates needed to relocate)

2.8.4.3.5 If no spermatozoa are located after a quick preliminary search, stain the smear according to FB SOP-14.

2.8.4.4 If subsequent staining and microscopic searching results in no spermatozoa identified, test the corresponding swabs.

2.8.5 Swab Examination

2.8.5.1 Multiple swabs collected from the same orifice/area and submitted as one item will be considered one sample and therefore will be tested for semen, amylase and blood accordingly.

2.8.5.2 Figure 2 will be used as guidance for testing workflow.

2.8.5.3 If multiple swabs in an item appear reddish-brown stained, it is only necessary to conduct blood screening test(s) on a portion of one (1) swab per item.

2.8.5.4 Acid phosphatase testing may be conducted prior to swab extraction.

2.8.5.5 Extraction guidelines:

2.8.5.5.1 In general, combine ~1/4 of each swab per item to equal a total of one half to one whole swab according to the number of swabs present.

2.8.5.5.2 If greater than four (4) swabs are present, then reduce the portion removed from each swab accordingly.

2.8.5.5.3 If one (1) to three (3) swabs were received, all remaining sample will be used for extraction.

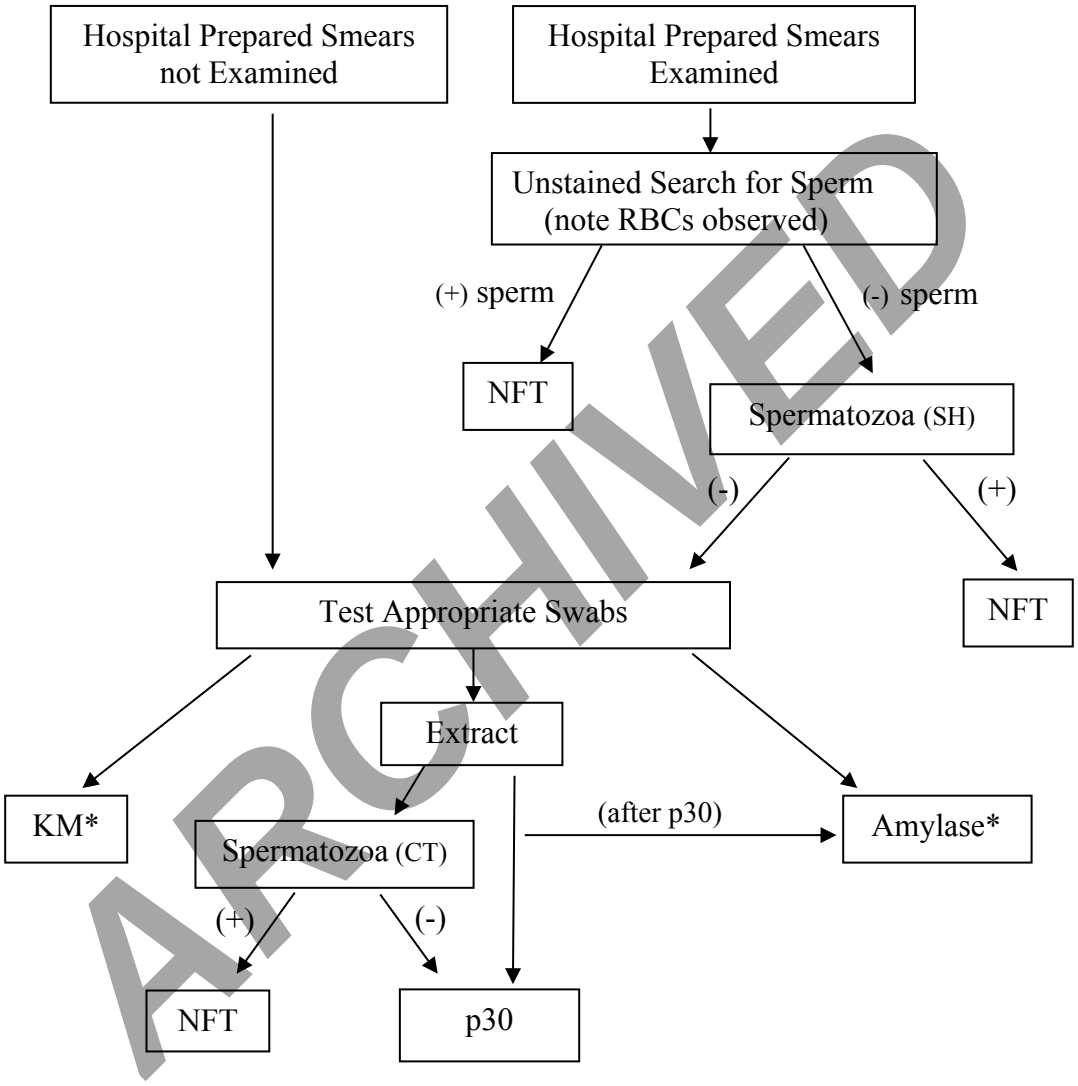
2.8.5.6 Extract sample according to FB SOP-13.

2.8.5.7 If no corresponding smears were previously examined, a smear will be made from the extract and microscopically examined (FB SOP-14).

2.8.5.8 The extract can then be tested for p30 and amylase, if warranted, according to FB SOP-15 and SOP-16.

2.8.5.9 If the swabs present are to be amylase tested only, take a portion of each as outlined in FB SOP-01 and test according to FB SOP-16.

2.5.10 Figure 2: General Pathways of Body Fluid Testing



RBC's=Red Blood Cells
SH=Sperm Hy-Liter stain
CT=Christmas Tree stain
Inc=Inconclusive
NFT=No Further Testing
NT=Not Tested (due to compromised sample)
*May be conducted regardless of semen testing

2.6 REFERENCES

A. GL-2 (Safety Manual)
B. GL-4 (LIMS)
C. GL-5 (Ethics)
D. GL-13 (General Evidence Handling)
E. Public Act No. 15-207 (An Act Concerning Evidence in Sexual Assault Cases)