DNA Evidence and Issues

Summary

Instructor: Law Enforcement
Time Needed: 3 hours (with one 20-minute break)
Resources Needed:
- Self-test on DNA evidence
- Cotton swabs (several for each participant)
- Preliminary Rape Case Information (Handout)
- Lab Service Request (Handout)

Task 1

Explain the general nature and purpose of DNA evidence in a sexual assault investigation, including discussion of CODIS or other databases.

Presentation: Brainstorming exercise
Time: 15 minutes

After a brief introduction of the general nature of DNA evidence, ask participants to think of different ways that it might be used in a sexual assault investigation. Call on volunteers and write the responses on an overhead or flip chart.

Possible answers include: (1) confirming the identity of a known suspect; (2) identifying an unknown suspect based on a match with evidence collected in another case; (3) excluding a suspect from consideration; and (4) exonerating an individual who has been wrongly convicted. In some jurisdictions, it may be used to issue a warrant for a suspect whose identity (i.e., name) is not currently known. The instructor can suggest any of these ideas not raised by participants. Participants may also generate additional ideas which can be recorded.

Allow time for discussion, and highlight the fact that DNA evidence is primarily useful in sexual assault cases where identification is the issue. Note that this will most likely be in cases of stranger assault, and that this is therefore the one unit in this training curriculum that does not focus on cases of acquaintance rape where the issue is likely to be consent. Also make sure to discuss the use of DNA databanks such as CODIS.
Task 2

Identify possible sources of DNA evidence.

Presentation: Learning pairs Time: 20 minutes

Ask participants to pair up with someone sitting near them. If the number of participants is uneven, make a single group of three. Then ask the learning pairs to generate a list of possible sources for DNA evidence. For example, semen is the source of DNA evidence most commonly thought of in the context of sexual assault investigation. However, there are several other biological sources of DNA evidence to consider. Have each member of the learning pair record the list in their notes, titled "Sources of DNA evidence." Give the pairs a few minutes to generate their lists. Then put up the list on the overhead, and ask participants to add to their list any items that they might have missed. Finally, ask if any pairs came up with ideas not included on the overhead. Have participants add these new ideas to their lists. Highlight the vast promise of DNA evidence given these many potential sources.

Task 3

Recognize various barriers to realizing the potential of DNA evidence, and ways of overcoming these barriers.

Subtask 3.1

Discuss the various barriers to realizing the potential of DNA evidence.

Presentation: Brief lecture Time: 15 minutes

Subtask 3.2

Discuss ways to overcome these barriers.

Presentation: Brief lecture Time: 15 minutes Handouts: Preliminary Rape Case Information Lab Service Request

Task 4

Review proper procedures for collecting, packaging, and storing DNA evidence.

Presentation: Brief introduction Time: minutes

Subtask 4.1

Recognize correct procedures for collecting, packaging, and storing DNA evidence.

Presentation: Self-test with review Time: 60 minutes
Provide participants with the DNA evidence self-test and ask them to complete it to the best of their ability. Encourage guessing for those questions to which they do not have an answer. Assure participants that no one will see their responses, but they can score their test during the discussion to follow. Give participants time to complete the self-test and then walk through the correct answers with discussion and additional information on each topic. Recognize variation in the policies and practices of different jurisdictions, but reinforce proper procedure in cases where local practice can be improved.

**Subtask 4.2**

Collect DNA evidence properly using mouth (buccal) swabs.

Presentation: Skill practice Time: 30 minutes

First, explain the proper procedures for collecting DNA evidence using mouth (buccal) swabs. Then, distribute regular cotton swabs and ask participants to practice by collecting evidence from a classmate. Monitor their performance, and allow time for discussion.

**Self-Test: Collecting, Packaging, and Storing DNA Evidence**

1. Mark all correct answers. DNA analysis conducted by the crime laboratory can be assisted by law enforcement by:

   _____ Collecting all items with potential evidentiary value.

   _____ Obtaining extensive information about the case from the victim.

   _____ Summarizing details of the case for crime lab personnel to guide screening of crime scene evidence.

   _____ Writing very general requests for lab service to avoid limiting the potential analyses to be conducted.

2. Mark all correct answers. If blood evidence is collected, it is necessary to determine:

   _____ Whether the victim or suspect bled during the assault.

   _____ Which specific areas of the victim's or suspect's body produced blood.

   _____ Whether the victim was menstruating at the time of the assault.

   _____ Whether the victim or suspect recently received a blood transfusion (i.e., in the last 90 days.)
3. Circle the correct answer. If the victim's clothing was removed during a sexual assault, it is not likely to have any evidentiary value.

True

False

4. Mark all correct answers. In which of the following situations is bedding likely to have evidentiary value?

_____ The suspect's seminal fluid is found in his own bed, where the assault is alleged to have occurred. The suspect denies having sex with the victim.

_____ The victim's epithelial cells are found in the suspect's bed, where the assault is alleged to have occurred. The suspect denies having sex with the victim.

_____ The suspect's seminal fluid is found in the victim's bed, where the assault is alleged to have occurred. The suspect denies having sex with the victim.

_____ The suspect's seminal fluid is found in the victim's bed, where the assault is alleged to have occurred. Both suspect and victim acknowledge having recently had consensual sex in the same bed.

5. Mark all correct answers. The victim reports a sexual assault that took place in her bed, and there is seminal fluid evidence found in the bed. The victim also reports that she recently had consensual sex with her boyfriend (who is not the suspect) in the same bed. In this case, it is important to obtain DNA reference standards from:

_____ The suspect.

_____ The victim's boyfriend.

_____ The victim.

6. Circle the correct answer. Even when done correctly, mouth (buccal) swabs are generally considered to be inferior to blood samples as a means of collecting DNA reference standards.

True

False

7. Mark all correct answers. When submitting a lab request:
It is not necessary for the investigator to prioritize items of evidence to be analyzed because crime lab personnel are better prepared to make this determination.

It is better to make general requests for lab service, to avoid limiting the potential analyses to be conducted. For example, it is better to request that the victim’s "rape kit" be analyzed rather than the "vaginal swabs."

It is desirable to have all lab service requests reviewed by a supervisor to monitor the requests that are being submitted to the crime laboratory.

8. Choose one. Clean latex gloves should be worn when collecting items of evidence. It is recommended to change gloves between the handling of different items of evidence.

1. Only the first statement is true.
2. Both statements are true.

9. Choose one. Each item of evidence:

1. can be packaged together if they come from the same source (e.g., victim or suspect).
2. must be packaged separately.

10. Choose the one incorrect statement. Blood, semen, and other types of stains:

1. must be thoroughly air-dried before packaging.
2. must be packaged in sealed paper envelopes or paper bags.
3. can be dried using a fan.
4. can be dried using a hairdryer on a regular, warm setting.

11. Choose one. Used condoms should be:

1. placed in a paper bag.
2. placed in a sterile tube and frozen.
3. placed in a clean, air-tight container and refrigerated.

12. List the information that must be marked on packages for proper chain of custody documentation.

________________________________________________________________________
________________________________________________________________________
13. Choose one. If stains must be transferred from an unmovable surface (such as a window or sidewalk), sterile cotton swabs can be used. If the stain is dried, the swab can be moistened with:

1. saline solution.
2. regular tap water.
3. distilled water.

14. Which one of the following statements is incorrect regarding stains on unmovable surfaces (such as a window or sidewalk)?

1. The stain should be photographed with a ruler before swabbing.

2. Only one control swab should be collected for comparison purposes, from an unstained area adjacent to the stain.

3. Swabs should be air-dried, without permitting them to touch each other.

4. Swabs should be stored in separate, properly marked envelopes or paper containers.

15. Choose one. Evidence which is incapable of drying (e.g., pieces of tissue, organ, bone, liquid urine, vomit, or other biological material) should be:

1. packaged in a paper container if possible, and refrigerated.

2. packaged in an air-tight container and frozen.

3. preserved in formalin or formaldehyde for DNA analysis.

16. Mark all correct answers. Known standard blood samples should be:

_____ Stored in a purple top tube.

_____ Placed (in the tube) in a paper container.

_____ Sealed with evidence tape (in the paper container).

_____ Marked if taken from an individual diagnosed with HIV or hepatitis.

_____ Frozen.
17. Circle the correct answer. For biological evidence other than known standard blood samples, the rule of thumb for storage is "the colder the better."

True
False

18. Which one of the following is not a proper way to ship DNA evidence?

1. Hand carried on any day of the week.
2. Shipped by overnight courier service on a business day.
3. Shipped by courier service on a weekend or holiday.

19. Which one of the following types of biological evidence should not be shipped on dry ice?

1. Liquid blood.
2. Liquid urine.
3. Tissue samples.
4. Bone samples.

20. Mark all correct answers. Blood standards from persons diagnosed with HIV or hepatitis should be shipped:

_____ Using a specialized container such as a SAF-T-PAK.
_____ With a shipping tag for dangerous goods.
_____ At room temperature.
_____ By priority overnight courier service.

21. Circle the correct answer. When collecting fetal tissue evidence, it is important to immediately alert the medical facility not to add any fixative or preservative such as formalin, formaldehyde, or other liquid.

True
False
Self-Test: Collecting, Packaging, and Storing DNA Evidence (Answers)

1. Mark all correct answers. DNA analysis conducted by the crime laboratory can be assisted by law enforcement by:

   __X__ Collecting all items with potential evidentiary value.
   __X__ Obtaining extensive information about the case from the victim.
   __X__ Summarizing details of the case for crime lab personnel to guide screening of crime scene evidence.
   _____ Writing very general requests for lab service to avoid limiting the potential analyses to be conducted.

2. Mark all correct answers. If blood evidence is collected, it is necessary to determine:

   __X__ Whether the victim or suspect bled during the assault.
   __X__ Which specific areas of the victim's or suspect's body produced blood.
   __X__ Whether the victim was menstruating at the time of the assault.
   __X__ Whether the victim or suspect recently received a blood transfusion (i.e., in the last 90 days).

3. Circle the correct answer. If the victim's clothing was removed during a sexual assault, it is not likely to have any evidentiary value.

   True
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4. Mark all correct answers. In which of the following situations is bedding likely to have evidentiary value?

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   __X__ The victim's epithelial cells are found in the suspect's bed, where the assault is alleged to have occurred. The suspect denies having sex with the victim.
   __X__ The suspect's seminal fluid is found in the victim's bed, where the assault is alleged to have occurred. The suspect denies having sex with the victim.

   Successfully Investigating Acquaintance Sexual Assault
The suspect's seminal fluid is found in the victim's bed, where the assault is alleged to have occurred. Both suspect and victim acknowledge having recently had consensual sex in the same bed.

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__X___The suspect.
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2. **placed in a sterile tube and frozen.**

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12. List the information that must be marked on packages for proper chain of custody documentation.

   _____CASE NUMBER_____________________________________________

   _____ITEM NUMBER_____________________________________________

   _____DATE_______________________________________________________

   _____INITIALS ACROSS THE SEALS OF THE PACKAGE______________

13. Choose one. If stains must be transferred from an unmovable surface (such as a window or sidewalk), sterile cotton swabs can be used. If the stain is dried, the swab can be moistened with:

1. saline solution.

2. regular tap water.

3. **distilled water.**

14. Which one of the following statements is **incorrect** regarding stains on unmovable surfaces (such as a window or sidewalk)?

1. The stain should be photographed with a ruler before swabbing.

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**True**

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