



INDIANA STATE POLICE FORENSIC SERVICES DIVISION

PHYSICAL EVIDENCE BULLETIN

EVIDENCE COLLECTION FOR DNA ANALYSIS

DNA evidence can provide a link between two people or between a person and a place. When standards are available, DNA analysis can distinguish between a person who could have contributed a DNA profile (inclusion) and a person who could not (exclusion). The ability to obtain a DNA profile will often depend on how well the specimens are collected and preserved.

The following are examples of evidence that should be considered for DNA analysis:

- Blood and bloodstains
- Semen and semen stains
- Epithelial cells (e.g., from cigarettes, bottles, cans, etc.)
- Skin and other tissues
- Bones
- Organs
- Hair

I. GENERAL EVIDENCE HANDLING

- A. Air dry body fluid stains before packaging.
- B. Package all dried body fluid stain evidence separately and in paper. Never use plastic bags or containers to store stained articles.
- C. Securely affix a biohazard sticker to the outside container in a conspicuous place.
- D. Store all dried body fluid stain evidence in low humidity and as cool as possible to minimize degradation. Storage in a refrigerator or freezer may be preferred; however, room temperature is acceptable. Factors to consider include the size of the evidence item, the available space, type and material of item, and impact on subsequent examinations.
- E. The Request for Laboratory Examination Form shall be completed when submitting biological evidence.
 - 1) The Indiana State Police (ISP) Forensic Services Division (FSD) is required to collect and maintain documentation on CODIS eligibility.

Every effort should be made to answer the specific questions asked. Case scenarios shall include details of how items collected for DNA analysis are related to the criminal activity. The information requested by the form assists analysts in appropriate interpretation of results and determination of CODIS eligibility.

- 2) Racial descriptions are only required for relationship testing and should **not** be routinely included in item descriptions or case summaries.
- 3) The Request for Laboratory Examination Form shall only include known facts pertaining to a case. Opinions and speculation surrounding the case shall not be included. This does not apply to the submission of individuals as named suspects.

F. Due to the high probability of cross contamination and extraneous, non-probative DNA results, the following items will not routinely be accepted:

- 1) Items of evidence previously examined by other disciplines (e.g., drugs or firearms) without proper DNA precautions.
- 2) Currency (coins or bills) without a presumed body fluid.

II STANDARDS FOR COMPARISON

The submission of DNA standards from all individuals believed to be involved in a case can significantly increase the speed and efficiency of DNA analysis. Elimination standards from individuals whose DNA may be reasonably found on an item should be submitted. Cases that are not eligible for entry into the DNA Database and in which there are no suspect standards nor elimination standards will not be accepted. Items submitted as standards shall be clearly labeled as standards on the Request for Laboratory Examination Form.

A. DNA standards from living individuals

- 1) Oral/buccal swabs (i.e., swabbings from inside the cheek) shall be air dried and sealed in an envelope.
- 2) The presence of a suspect's convicted offender or arrestee sample in the Combined DNA Index System (CODIS) does not replace the requirement for a new evidentiary suspect standard for comparison to crime scene evidence. Matches generated by CODIS database searches are meant to provide investigative leads and probable cause information. An evidentiary standard will still be requested from the individual for criminal prosecution.

B. DNA standards from deceased individuals

- 1) Collect venous blood on a stain card and air dry completely before packaging in a paper envelope.
- 2) If a stain card is not available, one sample of venous blood, at least 5 milliliters (ml), can be collected in a purple top vacutainer (EDTA tube).
- 3) When venous blood is not obtainable, blood from the heart or major internal blood vessel or organ should be collected on an approved stain card or in a purple top vacutainer.
- 4) Liquid blood samples should be refrigerated (not frozen) until submitted to the ISP FSD.

- 5) Note on the Request for Laboratory Examination Form if the person has received a blood transfusion within the last 120 days.
- 6) Note on the Request for Laboratory Examination Form if the person has ever received a bone marrow transplant.
- 7) If a blood sample is unobtainable, hair, bone, tooth, and/or tissue sample should be collected.
 - a. HAIR: should consist of approximately 30 hairs. Hairs should be pulled out.
 - b. BONE OR TOOTH: at a minimum one bone sample of at least three inches in length, or one whole tooth with no fillings (molars are preferred). Preferred bone selection may include sections of a femur, a metatarsal or patella. Submission of multiple bone/tooth standards is strongly recommended, especially for potentially poor-quality samples (dry, damaged, sun-bleached, etc.).
 - c. TISSUE: approximately 1 square inch if little or no decomposition has occurred.
 - d. Hair, bone, tooth, and tissue samples should be packaged in a clean container without any preservatives and frozen until submitted to the ISP FSD.
- 8) Consider collection and/or submission of multiple types of samples (i.e., both blood and bone) to increase the likelihood of at least one high quality sample.
- 9) Alternately if a blood sample is unobtainable, an individual's clothing and/or blood-stained evidence immediately below the body may be used as a secondary standard.
- 10) Prior to submission, check with ISP FSD personnel to determine what is suitable for use as a secondary standard.

NOTE: If blood alcohol or toxicology analysis will be conducted, an additional sample should be obtained in a blood alcohol vacutainer provided by the Indiana State Department of Toxicology. These grey top vacutainers contain the preservatives sodium fluoride and sodium heparin and are **not** appropriate to use for DNA standards.

C. Surreptitious collection of standards

- 1) Surreptitious standards are those collected without the knowledge of the person of interest. Surreptitious standards may be collected for investigative reasons.
- 2) A standard collected surreptitiously should be directly attributable to a specific individual. If multiple individuals of the same biological sex as the person of interest live in a household a trash collection may not be appropriate.
- 3) Items with likely body fluids from a single individual are preferable for use as a surreptitious standard. Examples of good samples include: drink cups or cans, used food utensils, bandages, dental flossers, face masks, licked envelopes, tampons, or Q-tips.

- 4) Touch DNA items are generally not suitable for use as a surreptitious standard. Examples of poor samples are: prescription bottles, batteries, or written notes.

III. CRIME SCENE EVIDENCE HANDLING

If needed, please contact your local ISP District for a Crime Scene Investigator for assistance with crime scene processing.

- A. Wear disposable latex gloves (or equivalent) while processing or collecting any evidence that may be used for DNA analysis. Gloves should be changed regularly and/or between items collected.
- B. Photograph the evidence and its relative position at the crime scene before it is touched, moved, or collected.
- C. Sketch the crime scene to establish spatial relationships.
- D. Collect physical evidence for DNA analysis.
 - 1) Evidence with wet body fluid stains should be completely air dried, not in direct sunlight.
 - a. After dried, package the articles in separate paper containers.
 - b. Do not package in plastic bags.
 - 2) Objects that cannot be submitted to the ISP FSD can be processed using one of the following techniques:
 - a. Moisten one or more sterile cotton swabs with water (distilled water should be used) and swab the stain or area of interest. Air dry and package in paper.
 - b. Scrape the stain onto a clean sheet of paper using a clean scalpel. Carefully fold the paper and package in a paper envelope.
 - c. Take a cutting of the stained area (i.e., carpet). Air dry and package in paper.
 - 3) Phenolphthalein reagent can interfere with the DNA analysis process.
 - a. Phenolphthalein testing should only be performed when a sufficiently large stain or multiple stains are available to collect and submit an untested sample to the ISP FSD.
 - b. If a portion of the stain was collected on a swab and tested for the presence of blood using the Phenolphthalein test, that swab should not be submitted for DNA analysis unless it is the only sample available.
 - 4) For pooled liquid body fluids, use one or more sterile cotton swabs to absorb the liquid. Air dry the swabs and package in paper.
 - 5) Samples such as cigarette butts, envelopes, stamps, etc., to be analyzed for epithelial cells should be collected with clean tweezers or gloves and packaged in paper.
 - 6) Bottles or cans should be carefully emptied of any remaining contents before packaging in paper.
 - 7) Hair evidence should be collected using clean tweezers.

- a. Hairs collected from different locations should be packaged separately.
- b. If hairs are mixed with wet body fluids, they shall be air dried.
- c. Package all hair evidence in paper.
- d. Clean Post-it® style notes can be used to secure hairs within an envelope.

IV. TOUCH DNA SAMPLES

Touch DNA refers to analysis which targets skin cells transferred through physical contact. It should be noted touch evidence does not include cigarette butts, cans, bottles, etc. as those most likely contain saliva. Nor does it include items submitted for wearer (i.e., articles of clothing), where there is probability of prolonged contact and therefore more DNA deposited.

- A. Our policy is to only consume as much sample as needed to obtain results, and we strive to retain samples for the possibility of future testing. However, when DNA is deposited by physical contact only (no body fluids present), it is typically necessary to consume the entire sample. Attempting to divide the sample in any way, collecting it over multiple swabs or only consuming a portion of one swab, reduces the opportunity to obtain meaningful results, either during initial analysis or in any subsequent testing of the retained portion.
- B. Touch DNA evidence will not be accepted or tested for DNA without permission to consume the sample in its entirety. To obtain results when DNA is presumed to have been left by an individual touching or briefly handling an object/surface, permission to consume the sample is necessary. If such permission is not documented on the Request for Laboratory Examination Form, no DNA analysis will be performed.
- C. Touched items with multiple disciplines requested, particularly DNA and fingerprint requests, will be evaluated by the respective subject matter experts. In many cases, separate parts of the item can be examined. However, in some instances, there may not be enough suitable surface area for sampling touch DNA while preserving the opportunity for other examinations. If, due to the nature of the item, processing by one forensic discipline may have a detrimental effect on the other, staff shall use their best judgment and discretion to determine the most appropriate analysis, unless otherwise stated by the contributor.
- D. It is recommended, based on a completed case study that separate swabs be collected from different areas of guns to include the following areas.
 - 1. Grip
 - 2. Trigger and trigger guard
 - 3. Slide
 - 4. Magazine
- E. Due to extremely low success rates, the ISP FSD will not examine cartridges, cartridge cases, or swabs of these items for the presence of DNA except in extenuating circumstances with the approval of the Laboratory Manager or a Biology Unit Supervisor.
- F. The ISP FSD will also evaluate all non-touch DNA items at the time of testing and if the analyst's opinion is that they may not get a conclusive result without

consuming the sample, those stains or items will not be tested without permission to consume.

- G. Research on the extraction of touch DNA off of certain metals indicates that success rates increase the sooner the DNA is removed from the metal (particularly with copper and brass). It is recommended that touch DNA deposited on metal be swabbed as soon as reasonably possible prior to submission to the laboratory for best results.
 - i. For cartridge casings that may be sent to a private lab for analysis, no swabs should be taken of the item.

V. SEXUAL ASSAULT INVESTIGATIONS

In sexual assault cases, the investigator or police officer is not able to collect the physical evidence from the victim's person, or in most cases be present when the evidence is collected. The collection of this evidence can only be done by health care personnel during the medical examination of the victim.

- A. A sexual assault evidence collection kit should be used by medical personnel to collect evidence from sexual assault victims. For the best possible evidence to be collected, medical personnel must be properly trained in the complete evidence collection procedures.
- B. In sexual assault cases, additional items should be considered for collection, such as underpants from the victim(s) and suspect(s).
- C. A chain of custody should be maintained from the time evidence is collected until transferred to a law enforcement agency.
 - 1) A procedure should be developed and implemented at the medical facility to ensure that the chain of custody documents the identity of the item(s). The chain of custody record should include the individual(s) receiving or transferring the item(s), evidence storage location(s), and the chronological order of transfers.
 - 2) Evidence should be handled by a minimal number of individuals.
- D. Medical facilities should establish and follow a procedure for:
 - 1) Collecting all necessary specimens and other evidentiary material.
 - 2) Labeling all evidence including the contents of each container with the victim's identifier.
 - 3) Obtaining consent for release of evidentiary material.
 - 4) Notifying a law enforcement agency that the evidentiary material has been collected.
 - 5) Storing the evidence in a secure location pending release to a law enforcement agency. Kits with a liquid blood standard or vaginal wash should be stored in a refrigerator. Kits without a liquid blood standard or vaginal wash may be stored at room temperature or in a refrigerator.
 - 6) Submitting the evidence to a law enforcement agency.
- E. Evidence Collection Kits

- 1) Instructions for proper evidence collection are present in evidence collection kits provided by the ISP Department.
- 2) It is recommended that the Victim Sexual Assault Evidence Collection Kit be used to collect evidence as close to the time of the incident as possible, preferably within five (5) days of the incident. However, kits can be used to collect evidence at a later date if the investigation warrants such collection and the victim is cooperative.
- 3) ISP Suspect Evidence Collection Kits are no longer being produced. If a suspect is arrested within 24 hours of the incident, samples should be collected based on the case scenario. External penile swabs (or finger swabs in the case of digital assault) should be collected using moistened, sterile cotton swabs (distilled water should be used). Suspect standards should be collected as described above in Standards for Comparison.
- 4) Other types of kits not created by ISP (such as Domestic Battery/Strangulation kits) will be evaluated on a case-by-case basis and may require submission of standards for comparison if deemed ineligible for CODIS.
- 5) Victim Sexual Assault Kits (SAK) collected on or after April 1, 2020 must be entered in the Indiana Criminal Justice Institute's (ICJI) [Statewide Sexual Assault Kit Tracking System](#) (SAKTS) prior to submitting the kit for analysis to ISP FSD. The associated personal identification number (PIN) shall be recorded on the SAK box near the SAK bar code, as well as provided on the Request for Laboratory Examination Form.
- 6) SAKs collected during autopsies are not required to be entered into the Indiana SAKTS, consistent with ICJI operating guidelines for the SAKTS, and those SAKs shall be clearly marked at the time of submission as "autopsy".
- 7) All SAKs from reporting victims, regardless of the date of collection, will be accepted for analysis by the ISP FSD. SAKs from non-reporting victims (also known as "anonymous" or "Jane Doe" kits) will not be accepted for analysis by the ISP FSD.

VI. PATERNITY ANALYSIS FOR CRIMINAL PROSECUTION

- A. Paternity analysis requires DNA standards from the child, mother, and alleged father(s) following the procedure in [Section II](#) above.
- B. In the case where there is a pregnancy that does not go to full term, the product of conception representing the child is needed for analysis.
 - 1) The type of sample(s) obtained is dependent on the medical facility collecting the sample(s).
 - 2) A representative sample(s) of the product of conception should be collected, which may include umbilical cord blood, a portion of the placenta, and/or other tissue samples. Pathologist consultation is recommended, especially in chemical termination prior to 10 weeks.
 - 3) Product of conception samples should be stored frozen with no preservatives until submission to the ISP FSD.

4) Standards from the mother and alleged father(s) should be collected as described in [Section II](#) above.

C. Record on the Request for Laboratory Examination Form if other genetic relationship calculations are required.

VII. CONTACT INFORMATION

The proper collection and preservation of biological evidence is critical for DNA analysis. Please contact the Biology Section of the ISP Regional Laboratory in your area with any questions at the following numbers.

Evansville	(800) 852-3970
Fort Wayne	(800) 552-0976
Indianapolis	(866) 855-2840
Lowell	(877) 874-0009

Regional Laboratory hours are 8:00 a.m. to 4:30 p.m., Monday through Friday.

BASIC DNA EVIDENCE COLLECTION RECOMMENDATIONS SUMMARY

(SEE SECTIONS [II](#) AND [III](#) FOR DETAILED INSTRUCTIONS)

STANDARDS	Collect an oral/buccal swab. Air dry. Or collect blood in purple top vacutainer. Refrigerate.
POOLED LIQUID BLOOD OR SALIVA SAMPLES	Collect on sterile cotton swabs. Air dry.
DRIED SAMPLES	Either collect object (or a cutting/portion of the object if it is large), scrape into a clean container, or use a distilled water moistened sterile cotton swab to collect. Air dry.
BONE, TOOTH OR TISSUE SAMPLES	Collect in clean specimen container without preservative. Freeze.