

INVESTIGATOR'S GUIDE TO NATIONAL FORENSIC LABORATORY SERVICES

A guide on how to collect, preserve and submit evidence to the RCMP's National Forensic Laboratory Services (NFLS).

More detailed information and guidance is available to investigators by contacting the NFLS Forensic Assessment Centre (FAC):

 **1-866-677-5227**

 **FAC-CEJ@rcmp-grc.gc.ca**



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Guide de l'enquêteur sur les services nationaux de laboratoire judiciaire

For safety and to prevent contamination
ALWAYS USE GLOVES AND A MASK

Your single point of contact at NFLS is the
FORENSIC ASSESSMENT CENTRE

To assist with the collection of evidence, you may contact your local
FORENSIC IDENTIFICATION UNIT

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CONTACT INFORMATION

FORENSIC ASSESSMENT CENTRE

The Forensic Assessment Centre (FAC) is the *single point of contact* for investigators requiring service at the RCMP's National Forensic Laboratory Services (NFLS). All requests for service at NFLS must go through the FAC for authorization prior to the submission of exhibits. The only exception is for counterfeit submissions, which go directly to the NFLS National Anti-Counterfeiting Bureau.

FAC representatives help ensure the correct services are selected and the most probative evidence is analyzed first. FAC employees answer questions about the collection, preservation and shipping of evidence for forensic analysis.

- ▶ Monday to Friday: 7 am to 9 pm (EST/Ottawa)
Saturday to Sunday: 10 am to 6 pm (EST/Ottawa)
- ▶ 1-866-677-5227
- ▶ FAC-CEJ@rcmp-grc.gc.ca
- ▶ *After hours:* A phone message is activated after hours that provides callers with emergency contact information.

NATIONAL ANTI-COUNTERFEITING BUREAU

Counterfeit exhibits must go directly to the NFLS National Anti-Counterfeiting Bureau (NACB).

- ▶ Monday to Friday: 8 a.m. to 4 p.m. (EST/Ottawa)
- ▶ 613-993-0664
- ▶ NACB@rcmp-grc.gc.ca

INTRODUCTION

ABOUT THIS GUIDE

This guide assists police investigators with the collection, preservation, and shipping of physical evidence to the RCMP's *National Forensic Laboratory Services (NFLS)*, which operates as a single public laboratory system with three sites located across Canada.

In addition to providing investigators with general information, this guide provides examples of some common exhibit types that are submitted to the different forensic service areas at NFLS – biology (DNA), toxicology, trace, counterfeit, and firearms. There could be other types of evidence not identified in this guide. For all general inquiries or questions, please contact the NFLS Forensic Assessment Centre (FAC).

ABOUT NATIONAL FORENSIC LABORATORY SERVICES

SINGLE POINT OF CONTACT

All requests for service to the RCMP's National Forensic Laboratory Services (NFLS) must go through the *Forensic Assessment Centre (FAC)* for authorization prior to the submission of exhibits. The only exception is for counterfeit submissions, which go directly to the NFLS National Anti-Counterfeiting Bureau (NACB).

- ▶ FAC employees work with investigators and clients to help ensure the appropriate services are selected and the most probative evidence is analyzed first.
- ▶ In cases where physical evidence requires analysis from two or more forensic services, FAC can advise on the order of analysis to help preserve the integrity of the exhibit.
- ▶ In addition to information about services offered by NFLS, FAC employees answer questions about the collection, preservation and submission of evidence for forensic analysis.
- ▶ Contact the FAC about the disclosure of case file information for court purposes.
- ▶ Contact the FAC to request the possibility of crime scene attendance.
- ▶ FAC may be able provide police investigators and clients with potential service providers for forensic analysis not offered by NFLS. For example, handwriting analysis, fibre analysis, glass analysis, animal DNA analysis, and botanical examinations, may be conducted by outside agencies.

FORENSIC SERVICES AT NFLS

BIOLOGY

- ▶ Biology services are generally performed in three stages and include:
 1. Evidence Recovery examinations include:
 - recovery and identification of body fluids such as blood, semen and saliva
 - recovery and identification of hair suitable for DNA analysis
 - recovery of cellular material from handled objects
 - recovery and preservation of non-biological materials including paint, glass and fibres
 - Textile Damage Assessment (TDA)

2. Analysts conduct nuclear DNA analysis and DNA profile development from the samples collected at Evidence Recovery.
 3. Reporting scientists use the information and analysis that has been gathered to:
 - interpret the results, including conducting comparisons of unknown DNA profiles to other unknown or known DNA profiles generated in the case
 - enter appropriate DNA typing profiles into the Crime Scene Index of the National DNA Data Bank of Canada
 - produce and provide a report containing the findings to the law enforcement agency that submitted the evidence
- Biology specialists can be called upon to provide expert testimony in courts.

FIREARMS AND TOOLMARK IDENTIFICATION

- Services include:
- legal classification and mechanical assessment of firearms
 - probable make and type (examining bullets or cartridges to determine the type of firearm used)
 - firearms identification (whether ammunition components were fired in/from a firearm)
 - examination of ammunition and ammunition components
 - ballistics (behaviour of a projectile within a firearm, after it has left firearm, and upon impact)
 - impact damage assessment and range determination
 - serial number restoration (using chemical treatments, as needed)
 - toolmark identification (examining exhibits with toolmark impressions and determining what tools were used to make the marks)
 - physical matching and comparison
- Firearms examiners may be available to attend crime scenes in the case of a complex shooting death. On site assistance includes determining: the relative position of the shooter(s); if the bullet impacts are primary or secondary (i.e. deflection/ricochet); the number of firearms and possible type of firearm used; the minimum number of shots fired; objects of forensic significance; and if impacts are entrances or exits.
- This area also conducts unsolved case searches with the Canadian Integrated Ballistics Identification Network (CIBIN). It links firearms crimes from across Canada and links crime scenes where the same firearm has been discharged even if the firearm has not been recovered. For more information, contact the NFLS Forensic Assessment Centre.
- Firearms specialists can be called upon to provide expert testimony in courts.

NATIONAL ANTI-COUNTERFEITING

- All suspect counterfeit currency, negotiable instruments, travel and identity documents and payment cards are submitted directly to the National Anti-Counterfeiting Bureau (NACB).
- Services include:
- examining, monitoring, evaluating threat level and report on counterfeit bank note activity passed and seized
 - providing Forensic Reports and Certificates of Examination
 - maintaining a national database (activity of all passed / seized bank notes recovered from circulation in Canada)
 - providing investigative aid and training to law enforcement

- publishing bulletins to advise of new counterfeit bank notes
- providing crime scene technical assistance – consultant role, help determine value of evidence
- providing online courses pertaining to bank notes, payment cards and travel documents
- ▶ Specialists from NACB can be called upon to provide expert testimony in courts.

TOXICOLOGY

- ▶ Toxicology services include:
 - The detection and analysis of drugs, including alcohol, and poisons in biological samples and other evidential material.
 - providing training and support for the Alcohol Breath Testing Program and the Drug Evaluation and Classification Program (DECP)
 - a report containing the findings to the law enforcement agency that submitted the evidence
 - independent opinion
- ▶ Specialists from toxicology can be called upon to provide expert testimony in courts.
- ▶ For toxicology services, please note:
 - In addition to the National Forensic Laboratory Services (NFLS) request form (C-414), requests for toxicology also generally require an additional “check sheet” to be completed and provided at the time the request. Contact the NFLS Forensic Assessment Centre for the latest version of this check sheet.
 - Toxicology services will generally not accept requests involving cases that will not result in criminal charges (e.g. suicide or murder suicide) or in cases that fall under provincial statutes.

TRACE ANALYSIS


- ▶ Services include:
 - recovering, comparing and identifying non-biological trace evidence (paint, potential fire accelerants, plastics, building products, safe insulation and commercial products, gunshot residue (GSR))
 - conducting physical matching of the seized materials
 - hosting and supporting the Paint Data Query (PDQ) database (i.e. assistance with no-suspect hit and run investigations)
 - analyzing pre- and post-blast samples to determine type of explosive
 - analyzing explosives ingredients and related materials
 - providing scene assistance including use of explosives detectors
 - providing scientific and technical support to bomb disposal and other experts in the field
 - providing a report containing the findings to the law enforcement agency that submitted the evidence
- ▶ Specialists from trace analysis can be called upon to provide expert testimony in courts.

BASIC GUIDELINES & TECHNIQUES

COLLECTION

Local forensic identification service units may be called upon to assist with the collection of evidence. They have the proper tools and their members have undergone specialized training to ensure evidence is collected properly and safely. The following are some general guides, tips and best practices that can be used by investigators should forensic identification members not be available to assist.

COMMON TOOLS AND SUPPLIES FOR COLLECTING EVIDENCE

 ALWAYS USE GLOVES AND A MASK		
TOOL	GENERALLY USED FOR	ADDITIONAL INFORMATION
Disposable scalpels	<ul style="list-style-type: none"> cutting stains from larger exhibits scraping paint samples from vehicles (e.g. hit-and-run incidents) 	<ul style="list-style-type: none"> if disposable tools are not available, rinse non-disposable tools between each use with alcohol or distilled water
Disposable tweezers and forceps	<ul style="list-style-type: none"> collecting small items (hair, building product particles, cigarette butts, etc.) 	<ul style="list-style-type: none"> DO NOT use metal tools on ammunition components
Disposable lancet	<ul style="list-style-type: none"> collecting known DNA samples from individuals onto collection cards 	<ul style="list-style-type: none"> found in the RCMP's DNA Warrant/Consent Collection Kits (blue bags) commercially available or from medical practitioner
Sterile swabs	<ul style="list-style-type: none"> collecting biological samples (e.g. blood, saliva, skin cells) soaking up liquid such as gasoline at an arson scene 	<ul style="list-style-type: none"> it is preferable to use sterile, cotton swabs that are individually wrapped within a re-sealable paper or plastic sleeve when collecting non-biological evidence, a best practice is to also submit an unused "control" swab (preferably from the same lot)
Sexual Assault Evidence Kits (SAEKs)	<ul style="list-style-type: none"> SAEKs are used to assist with the collection of evidence associated with sexual assaults – evidence is collected by trained health care professionals 	<ul style="list-style-type: none"> police can submit requests for forensic analysis regardless of whether it is part of a SAEK SAEKs are generally sealed by the health care practitioner when handed over to police ensure the health care professional that is collecting the evidence provides you with a list of all the samples/exhibits in the SAEK because you will need to list all items on the request form (C-414) when submitting for analysis (alternatively, you may break the seal in order to itemize the available exhibits)
Forensic Blood Collection Kit	<ul style="list-style-type: none"> used for toxicological analysis of blood (e.g. cases of impaired driving) 	<ul style="list-style-type: none"> contains two grey-stoppered vacuum tubes with a white powder that acts as preservative and anticoagulant The RCMP has a kit and it is also available commercially
DNA Warrant/Consent Collection Kit	<ul style="list-style-type: none"> used for collecting known DNA samples for comparison purposes there are three DNA Warrant/Consent Collection Kits: 	<ul style="list-style-type: none"> DNA Warrant/Consent Collection Kits are not to be used for submission of samples to the National DNA Data Bank blood samples are preferred for biology (DNA) analysis,

(blue bag)	<ul style="list-style-type: none"> – <i>Blood Sample</i> – <i>Buccal Sample</i> – <i>Hair Sample</i> 	<ul style="list-style-type: none"> followed by buccal (mouth swab) and then, hair. the RCMP's DNA Warrant/Consent Collection Kits are available to all police agencies, however, over versions are available by alternate service providers (the RCMP kits are identifiable by the blue bag used)
Convicted Offender DNA Database Sample Collection Kit (clear bag)	<ul style="list-style-type: none"> used to collect DNA samples from convicted offenders 	<ul style="list-style-type: none"> specifically designed for the collection of DNA samples from convicted offenders identifiable by the clear bag used these are the only kits that will accepted by the National DNA Data Bank (NDDB) of Canada to obtain these kits, contact the NDDB
Leak proof urine collection cup	<ul style="list-style-type: none"> used for toxicological analysis of urine (e.g. cases of impaired driving) 	<ul style="list-style-type: none"> commercially available or from medical practitioner
Gunshot Residue (GSR) Kit	<ul style="list-style-type: none"> collecting GSR samples from persons suspected of recently discharging a firearm collecting samples from objects suspected as having been exposed to a source of GSR, but cannot be easily submitted to the laboratory for analysis (e.g. a motor vehicle) 	<ul style="list-style-type: none"> contains instructions, a collection form, and two boxes each containing a pair of disposable gloves, a label, and two sample vials obtain samples as soon after the shooting as possible do not collect GSR samples if the item (e.g. piece of clothing) can be submitted to NFLS for GSR testing by a specialist complete the GSR Kit form at the time of sampling (include the GSR Kit form with your request form or confirm that it was enclosed and sealed along with the GSR samples) contact the NFLS Forensic Assessment Center to receive a GSR Kit
FTA collection card or Whatman 31 ET filter paper	<ul style="list-style-type: none"> collecting blood or buccal (mouth swab) samples from known individuals 	<ul style="list-style-type: none"> the FTA Collection Card is found in the RCMP's DNA Warrant/Consent Collection Kit (blue bags) Whatman filter papers are commercially available
Hemastix test strips	<ul style="list-style-type: none"> allows you to screen for the presence of blood 	<ul style="list-style-type: none"> identifies if blood may be present, either human or animal the strip should not come into direct contact with the material that is being collected advise the NFLS Forensic Assessment Centre (FAC) if the Hemastix strip came in direct contact with an exhibit, stained surface or swab (so that FAC directs the exhibit to the appropriate area for DNA analysis)

HANDLING EXHIBITS

PERSONAL SAFETY

Crime scenes and handling exhibits can be dangerous. Minimize exposure to infectious disease, hazardous drugs, and reduce the risk of contaminating the evidence by always wearing gloves and a mask when handling exhibits, including when you are collecting, packaging or shipping evidence. When finished, remove gloves and wash thoroughly with soap and hot water. Eye protection and other personal protection is also advised.

AVOID CONTAMINATING EXHIBITS

Keep exhibits that need to be examined completely separate from each other, from different scenes, and from comparison samples. Wear gloves at all times, changing them frequently (e.g. between exhibits and different areas of a crime scene). Avoid excessive handling of exhibits. Use a clean tool for each exhibit being processed. Use disposable tools such as scalpels whenever possible. Alternatively, clean all scissors and forceps thoroughly with alcohol between uses. Always package exhibits separately in clean bags or containers that will not leak, break or open. If accidental contamination is suspected, please inform the NFLS Forensic Assessment Centre at the time of your submission.

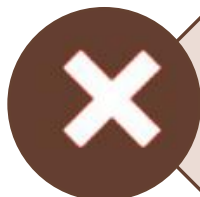
FINGERPRINTING

Fingerprinting is **not** a service provided by NFLS and is the responsibility of the investigator and agency. Your local forensic identification unit may provide this service or assist you in determining if the surface of the item is suitable for fingerprinting. Also, when conducting fingerprinting, avoid excessive handling of the exhibit, even while wearing gloves. Please note that if the exhibit requires both fingerprinting and other forensic services at NFLS, there is a recommended order and workflow. For example, fingerprinting and swabbing for DNA analysis are normally done prior to submitting firearm-related exhibits for firearm testing and examination. Contact the Forensic Assessment Centre for further guidance.

LARGE AND SMALL EXHIBITS

For larger exhibits with visible staining that cannot be submitted to NFLS (e.g. bed mattress, large carpet), the stains of interest may be cut out when required. Using a sterile disposable scalpel, carefully cut out the area of interest ensuring to leave a sufficient border around the stain. When collecting truly small particles, such as hair or paint chips, it is best to fold them in a piece of paper and seal in an envelope or plastic bag.

SWABBING PROTOCOLS FOR DNA



DO NOT swab knives or other items used on a person as a weapon. Properly package and submit any items used to cause injury or bodily harm directly to NFLS. If the object is too large, call the Forensic Assessment Centre (FAC) for more information.

DO NOT swab clothing items or fabric, chewing gum, or cigarette butts as the DNA is difficult to recover. Properly package these exhibits and submit to NFLS.



OK to swab all property crimes

OK to swab other offences with exhibits that cannot be easily submitted to NFLS and are expected to have ONE source of DNA (one person)

OK to swab blood, saliva or skin cells that are believed to be left on an exhibit (with the exception of fabric, chewing gum, or cigarette butts).



Fingerprint before swabbing since fingerprints may be wiped out during swabbing. Standard fingerprint technology does not interfere with analysis at NFLS, however, over handling the item may remove biological material.

Investigators may be required to collect biological samples for DNA analysis. Such material can be wet (e.g. a pool of blood), dry (e.g. dried blood stain on a carpet), visible (e.g. white stain, possible saliva/semen) or not visible (e.g. skin cells). In these situations, there are various collection methods available and different areas to swab that allow the highest potential to recover a DNA profile. Objects that have been handled by multiple individuals (door knobs or telephone receivers) are not recommended for forensic DNA analysis as they rarely yield useable information. See *Figure 1: Common examples of some areas to swab that provide the highest potential of DNA recovery.*

WHAT IS NEEDED FOR SWABBING

- ▶ Cotton sterile swabs (ensure they are not expired) should be individually wrapped in paper or plastic. Some swabs have a plastic cap or tubes that allow the swab to dry within the package.
- ▶ Disposable gloves
- ▶ Mask that covers your nose and mouth
- ▶ Sterile or distilled water preferably in a dropper bottle. If unavailable use bottled water.

HOW TO SWAB

- ▶ Wear mask and gloves, changing gloves between exhibits.
- ▶ If swabbing at a location other than where the exhibit was seized, use a clean surface (e.g. clean with bleach). Considering covering the work area with clean durable paper.
- ▶ Use one swab per area or stain (i.e. do not use two swabs for the same area/stain).
- ▶ **Swabbing a wet area** (e.g. pool of blood, foods or other wet items): collect the DNA using a dry cotton sterile swab.
- ▶ **Swabbing a dry area** (e.g. dried blood stain on carpet, tools, utensils, etc.):
 - With an eye dropper, dampen one side of a clean sterile swab with 1 or 2 drops of sterile or distilled water. **DO NOT** saturate. If distilled or sterile water is not available, use bottled or tap water.
 - Swab the area using the damp side first. Then, turn the swab over and swab the same area with the dry side.
- ▶ Apply reasonable pressure when swabbing so that enough material is collected (particularly if the surface is textured). The swab should remain intact.
- ▶ Avoid collecting excessive dirt/debris on the swab.
- ▶ Dry and label appropriately.

STORING AND DRYING SWABS

- ▶ **DO NOT** store moist swabs in airtight containers such as plastic bags or closed tubes. Moisture can lead to the growth of mold and bacteria which may limit the ability to obtain a DNA profile.
- ▶ Some swabs come in self-drying containers so it is acceptable to return the damp swab to its container. **DO NOT** put container in a plastic bag.
- ▶ When in doubt, or for swabs that require drying prior to packaging:
 - Use a drying cabinet or area with good ventilation where the swabs will not be touched or disturbed (to prevent contamination)
 - Ensure they are kept with their packaging to prevent mix ups

WHAT TO SWAB (AND NOT TO SWAB)

Following are some common exhibits showing what areas to swab that provide the highest potential of DNA recovery. In cases where an item is used as a weapon, **DO NOT** swab – send it “as is” to NFLS. More detailed information about the collection process for each of these exhibits is provided in the next section on collection and packaging “by exhibit type.”

Figure 1: Common examples of some areas to swab that provide the highest potential of DNA recovery

 DO NOT SWAB IF ITEM WAS USED AS A WEAPON AND BLOOD IS THOUGHT TO BE PRESENT			
Where to swab firearms and ammunition			
			
use one swab for grip, one swab for slide/action, one for trigger/trigger guard/safety	DO NOT swab if used as a weapon on a person causing injury or death. Submit the firearm “as is” to NFLS.	use one swab per group of cartridge casings or bullets of same caliber found in close proximity	
Where to swab tools – swab the area that is touched most often.			
			
	one swab inside glove, and one swab outside glove	swab knife if used as a handled object (e.g. pry tool)	DO NOT swab knife or other tools/items if used as a weapon on a person
Swab anything large with blood on it (floor, wall, window glass, furniture....). Use one swab per stain.			
			
blood stain on floor	glass with blood on it	 DO NOT swab fabric, textiles, clothing	

Where to swab drinking containers, utensils and food – swab the area that may have saliva on it



When swabbing food items,
freeze the item first, if possible

COMPARISON SAMPLES FOR DNA PURPOSES

DNA analysis is based on a comparative process wherein a DNA profile that is obtained from an exhibit is compared to the DNA profile from a known person, from personal effects or discarded items. For all DNA samples submitted to NFLS for comparison, clearly indicate on the C-414 form whether a sample is from consent, from a warrant, or a discarded item. In all cases, always wear disposable gloves, even when collecting comparison samples.

FROM KNOWN PERSONS

IN ORDER OF PREFERENCE:

1. Blood

- A blood sample can be collected using the RCMP's **Blood Sample** Warrant/Consent Collection Kit (blue bags), or a blood sample kit offered by another service provider.
- Use the FTA collection card in the collection kit or a Whatman 31 ET filter paper to collect the blood. The FTA collection card or Whatman 31 ET filter paper are preferred methods to collect blood samples, however, liquid blood is accepted in most cases.
- The collection of liquid blood must be performed by a healthcare practitioner who collects the blood in a lavender vacutainer tube, which contains preservatives and anti-coagulants.
- The collection of blood from a deceased person is done at autopsy.
- See section on "Exhibit Types" for the collection of a blood sample for biological analysis.

2. Buccal (mouth swab)

- A buccal sample can be collected using the RCMP's **Buccal Sample** Warrant/Consent Collection Kit (blue bags), or a buccal sample kit offered by another service provider.

QUESTIONS? CONTACT THE NFLS FORENSIC ASSESSMENT CENTRE 1-866-677-5227

3. Hair

- See section on “Exhibit Types” for the collection of a buccal/mouth swab sample for biological analysis.
- A hair sample can be collected using the RCMP’s **Hair Sample** Warrant/Consent Collection Kit (blue bags), or a hair sample kit offered by another service provider.
- See section on “Exhibit Types” for the collection of hair samples for biological analysis.

If it is not possible to collect any of the above samples (e.g. individual is under surveillance), consider collecting and submitting personal effects or discarded samples for comparison purposes.

FROM PERSONAL EFFECTS AND DISCARDED ITEMS

Personal effects, such as a toothbrush, razor or hair brush, can be collected and submitted as comparison samples. Personal items, usually from missing persons, are considered “quasi” knowns because it is not guaranteed that the object pertains solely to the user/owner of the item. As it relates to the personal effects of a known suspect, it is not possible to submit them as comparison samples without consent or a court-ordered warrant.

Discarded items, such as gum, a cigarette butt or a drinking container, can be collected and submitted as comparison samples, however, the act of discarding must be viewed by police. For example, the cigarette butt has to be seen by police as discarded by the suspect in order to be used as a comparison sample. Ensure that discarded sample is packaged, sealed and labelled separately and that the origin of the sample is clearly marked.

CREATING A DRY STAIN USING A COLLECTION CARD

- ▶ Use a FTA collection card or Whatman 31 ET filter paper and a disposable lancet to collect enough blood from a finger prick.
- ▶ Gently squeeze the finger, causing the blood to drop on to the card, approximately the size of a quarter.
- ▶ Allow the blood stain to dry completely. **DO NOT** fan the card or apply artificial heat to speed up the drying process (allow to dry naturally).
- ▶ Package, seal and label each known sample separately.
- ▶ Ensure the origin of the sample is clearly marked.
- ▶ Collection cards are stored at room temperature before and after sample application.

PRESERVATION AND STORAGE

The information below will assist in preventing the deterioration, unauthorized handling, loss, contamination and unnecessary alteration of exhibits during storage and prior to submitting exhibits to the RCMP’s National Forensic Laboratory Services (NFLS).

DRYING AND STORING EXHIBITS

Ensure exhibits are completely dry especially when using plastic bags (some *exceptions are noted below*). If a drying cabinet is not available, allow wet or moist exhibits to dry naturally in a clean low traffic area prior to packaging. **DO NOT** hand fan, use electric fans, hair dryers or other heat sources to speed up the drying

process as air currents and excessive heat may cause some loss of evidential material. Fully dried exhibits can be stored at room temperature provided it is not excessively hot or humid. The best storage for most exhibits is generally a freezer. If unavailable, use a fridge. If there is no fridge, you can store at room temperature, however, ensure the item is fully dried.

Exceptions

- ▶ **DO NOT** dry exhibits for arson investigations (e.g. fibre debris, suspect clothing). Arson exhibits should be packaged as soon as possible. See section on [Fire Debris](#) for more detailed information.
- ▶ Liquid samples and human tissue (e.g. muscle, aborted fetus, and other moist exhibits) should be stored in a frozen state whenever possible. Refrigeration can be used if freezing is not an option. Submit the samples to National Forensic Laboratory Services (NFLS) as soon as possible.
- ▶ Biological samples submitted for toxicological analysis should be refrigerated immediately and submitted as soon as possible to prevent the potential breakdown or loss of drugs (e.g., cocaine).

COMMON CONTAINERS

TYPE	CONTAINER STYLE	NOTES
Plastic	tamper-proof evidence bags	<ul style="list-style-type: none"> • apply tamper proof seal as directed • if any gaps are present after sealing, tape or heat-seals can be used • already packaged exhibits (e.g. swab holders, exhibits in paper bags) can be put into tamper-proof evidence bags
	plastic vials	<ul style="list-style-type: none"> • suitable for collecting biological samples • suitable for solid evidence such as building product materials, paint chips, ammunition fragments, etc. • ensure lids are put on tightly – consider using tape to seal the lid in place • not recommended for some solvents (e.g. gasoline) as it can dissolve the plastic • liquid samples (urine, melted snow) may leak depending on the lid type
Nylon	special bags for packaging fire debris	<ul style="list-style-type: none"> • 100% nylon • air tight (must be properly sealed) • easy to puncture • commercially available
Glass	lavender vacutainer tubes	<ul style="list-style-type: none"> • healthcare professionals, pathologists, coroners and other qualified medical professionals use these tubes to collect blood for DNA (please note dry stain collection is preferred to liquid blood sample) • contains an anti-coagulant • glass can break during shipping
	grey-stoppered collection tubes	<ul style="list-style-type: none"> • used for collecting samples that require toxicological analysis (blood, alcohol and drugs) • contains a special preservative and anti-coagulant • glass can break during shipping
	glass containers with chemical resistant cap closures (e.g. canning jars)	<ul style="list-style-type: none"> • rigid and puncture resistant • leak proof • ensure proper storage of empty canning jars – store them with their lids on and tightly closed • glass can break during shipping

	glass vials with a chemical resistant screw-cap lid (teflon lined)	<ul style="list-style-type: none"> • preserves liquid (acids, bases, solvents and fuels) • good for packaging solvents and caustic exhibits • have teflon-lined screw cap closures • air tight • glass can break during shipping
Metal	metal mailing tubes and ointment tins	<ul style="list-style-type: none"> • ointment tins are suitable for hair or other types of non-biological trace evidence • NOT suitable for material from arsons • resistant to punctures or breakage during shipment
	paint cans (new unused paint cans can be found at hardware stores)	<ul style="list-style-type: none"> • lined cans are best for arson related exhibits • rust resistant and can prevent leakage of volatile compounds of interest during an arson investigation
Paper	paper bag	<ul style="list-style-type: none"> • good option for shoes, which may be difficult to fully dry • suitable for packaging clothing (NOT suitable for clothing from arson suspects which must be packaged in an airtight container) • allows for moisture to breathe from the exhibit, reducing the chance of mould forming • difficult to seal properly
	cardboard box	<ul style="list-style-type: none"> • good packaging to place multiple <i>sealed</i> exhibits • helps ensure safe shipment and receipt of sharp exhibits, such as knives • use zip-ties to affix the sharp object inside the box for more effective contamination prevention – seal exhibit in a plastic bag prior to affixing to the box

PACKAGING AND SHIPPING

Proper packaging and delivery of exhibits to NFLS is critical. Improperly packaged exhibits can be a health hazard, may cause the exhibit to become contaminated or could even destroy the evidence. Improperly packaged exhibits might not be suitable for analysis and will be sent back to you by NFLS without further processing. Before submitting the exhibits, discuss packaging requirements with your local forensic identification services and/or the NFLS Forensic Assessment Centre (FAC).

SHARP OBJECTS

Objects such as knives, syringes, glass must be packaged properly to ensure the object/exhibit doesn't puncture through packaging. For glass and other breakable items, ensure there is plenty of protective material used when packaging. Knives should be packaged in a knife box, or protected, secured and tied down in a box.



DANGEROUS GOODS

Follow Transport Canada's [Transportation of Dangerous Goods Regulations](#): improper transportation of dangerous goods is an offence. For more information, contact the NFLS Forensic Assessment Centre (FAC) prior to shipping exhibits.

AMMUNITION

- Firearms and unfired ammunition must be shipped separately.
- For shipping of ammunition in amounts of less than 25 kgs., follow the [Transportation of Dangerous Goods Regulations](#). For this weight category, the shipping package must have a "1.4S" Transportation of Dangerous Goods (TDG) label attached to it and the shipping company/courier must be notified in writing (e.g. notation on the way bill) that the package contains a substance that is classified as "1.4S" for TDG purposes.
- Ammunition must be packed in a strong container that is securely closed to prevent opening during transit. Cartridges must be properly cushioned and protected from accidental discharge.

EXPLOSIVES

- Contact the NFLS Forensic Assessment Centre (FAC) to obtain an **explosive transport container**. It is the only approved shipping container for non-initiated explosive samples. There are instructions provided with the explosive transport containers, including teflon vials.

FIREARMS

- Ensure the firearm is unloaded and safe for handling before shipping. A visible securing device should be used through the action (e.g. zap-strap, triggerlock). Depending on the type of firearm, additional legal requirements must be met. For more information see the [Storage, Display and Transportation of Firearms and Other Weapons by Business Regulations](#).
- **DO NOT** place labels or tags over identifying marks or over areas that affect the operation of the firearm component. You can mark the container or affix a tag to the item, as required.

- Firearms must be registered to the investigating agency prior to shipping. A Public Agency Identification Number (PAIN) must be obtained and can be found on the RCMP public website, under the [Canadian Firearms Program](#).
- Firearms with broken stocks must be packaged properly to ensure the object/exhibit doesn't puncture through packaging. Ensure there is plenty of protective material used when packaging.
- The container should not bear any markings on the exterior to indicate that it contains a firearm.
- Firearms and unfired ammunition must be shipped separately.

GUN POWDER AND PRIMER CAPS

- Refer to [Explosives](#).

IGNITABLE LIQUIDS

- An Ignitable Liquid Transport Container (ILTC) is recommended to safely transport ignitable liquids. These containers are equipped with an inner protective metal can and lid, absorbent material, exhibit bags and sample vials along with instructions.
- Larger police agencies have their own ILTC. Other agencies should contact the NFLS Forensic Assessment Centre (FAC) to request an ILTC and provide the number of samples of suspected ignitable liquids you wish to submit for analysis.
- For more information, follow Transport Canada's [Transportation of Dangerous Goods Regulations](#): improper transportation is an offence.

INFECTIOUS SUBSTANCES

- An infectious substance is a micro-organism that is known or reasonably believed to cause disease in humans or animals. The infectious substance might be contained in blood, tissue, organs, body fluids, vaccines or cultures.
- In shipping infectious substances, follow Transport Canada's [Transportation of Dangerous Goods Regulations](#). In particular, refer to [Shipping Infectious Substances](#).

TOXICOLOGICAL EXHIBITS

- Label the exhibit container in a way that allows it to be uniquely identified (e.g. name of source, date, investigator information).
- Package according to [Transportation of Dangerous Goods Regulations](#).
- Place the exhibit container into a sealable plastic bag with absorbent packing material. Place this bag into another container strong enough to withstand transportation (e.g. a box).
- Ensure sufficient packing material is present to impede the movement of the exhibit container without/within the outer container.

PROPER CLOSURE

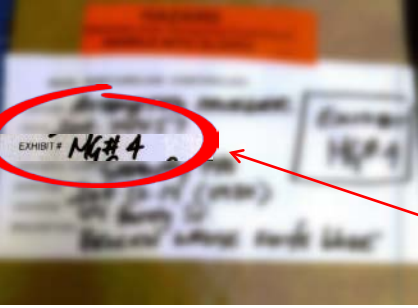
Inspect each layer of packaging to ensure they are properly closed and that at least one of the layers for each exhibit is sealed. Following are some examples of what constitutes a "sealed package":

- ▶ evidence bag
- ▶ heat-sealed plastic bags
- ▶ vials or jars, sealed with tape
- ▶ plastic or paper bags folded and sealed with sufficient tape

PROPER LABELLING

Delays can be caused due to the improper identification/labelling of exhibits. To ensure your submission is processed promptly, please ensure that exhibit identifier listed on Form C-414 (Request for Forensic Laboratory Analysis) matches exactly to the exhibit identifier used on the actual exhibit. These identifiers should also match exactly to information found on each layer of packaging.

Actual Exhibit



C-414

List Of Exhibits And Services Requested	
Agency Exhibit Number	Description One exhibit per section
MG#4	Seal

BY EXHIBIT TYPE

BIOLOGICAL (DNA) ANALYSIS

1. ADHESIVE TAPE (DNA)

① **Fingerprinting** on any adhesive tape-related exhibits must be done prior to submitting for DNA analysis. Contact your local forensic identification unit for fingerprinting services. Advise the person who is fingerprinting that DNA analysis will also be done and advise NFLS that the exhibit was first sent for fingerprinting.

- ▶ **DO NOT** swab – submit as is.
- ▶ Submit the tape for DNA analysis without removing it from the taped object, if possible.
- ▶ If removal from taped object is necessary, handle ends of tape as little as possible to allow for possible DNA sampling. Place adhesive-side down onto a new document protector.
- ▶ If cutting the tape is necessary to remove it from the object/person, mark the **cut ends** with permanent marker.
- ▶ Do not separate or straighten pieces.
- ▶ Package in tamper-proof evidence bags or rigid plastic or metal containers.
- ▶ Do not package in paper or cardboard containers.

2. AIRBAG (DNA)

- ▶ For cases involving injury of an individual, other than the driver, or in cases of death:
 - **DO NOT** swab. The entire airbag should be packaged and submitted to NFLS “as is” (without swabbing).
- ▶ For crimes against property (e.g. stolen vehicles) or cases of impaired driving:
 - If blood is visible, swab the blood stain only.
 - If no blood is visible, divide the airbag into halves and swab each half separately (one swab per half). Swab from the centre outwards, to about 2/3 of the distance to the outside.



3. BITE MARKS (DNA)

- ▶ When attempting to recover saliva or biological traces from a bite mark, use one swab over the bite mark. See [swabbing protocols for dry area](#).
- ▶ Only one swab is needed.

4. BLOOD (DNA)

4 A. BLOOD COLLECTED BY HEALTHCARE PROFESSIONAL

- ▶ Blood from a deceased person is collected at autopsy by the pathologist/medical examiner or designated assistant. Consider asking for a buccal (from mouth) swab or pulled hair sample as back up. Deep muscle tissue, bone and/or teeth can also be considered.
- ▶ Blood from a suspect or victim/complainant is collected by a healthcare practitioner (e.g. at hospital).
- ▶ Blood samples should be refrigerated and submitted to NFLS as soon as possible.
- ▶ Ensure all vials are properly sealed and labeled.
- ▶ **Note:** A dry stain is preferred: request that the healthcare professional create a dry stain using a FTA collection card or Whatman 31 ET filter paper.

4 B. BLOOD COLLECTED BY INVESTIGATOR

① *All necessary information and instructions for blood, buccal or hair samples are contained in the RCMP's DNA Warrant/Consent Collection Kits (**blue bags**). If a sample is being collected from a convicted offender, use the Convicted Offender DNA Database Sample Collection Kit (**clear bag**)*

From a person by consent

- ▶ Use a FTA card or Whatman 31 ET filter paper and a disposable lancet to collect the blood.
- ▶ Allow the blood stain to dry completely.
- ▶ Package, seal and label each known sample separately.
- ▶ Ensure the origin of the sample is clearly marked.

From a person by warrant

- ▶ DNA warrant legislation (sections 487.04 and 487.05 of the *Criminal Code*) (Form 5.02) allows for samples to be taken from suspects or accused individuals without their consent.
- ▶ NFLS recommends using the RCMP's Blood Sample Warrant/Consent Collection Kit (blue bag), which has been prepared specifically for DNA warrant or consent sample collection.

From a convicted offender

- ▶ Please refer to the National DNA Data Bank of Canada for more information.

From items at the crime scene

① *Direct contact between Hemastix test strips and a biological stain may negatively affect certain DNA analysis procedures. Advise the NFLS Forensic Assessment Centre (FAC) if the Hemastix strip has come in direct contact with an exhibit, stained surface or swab so that the exhibit is directed to the appropriate areas for DNA analysis.*

Blood stains on fabric or absorbent material (e.g. carpet, clothing):

- ▶ If possible, submit the entire item. Consult with FAC for large items.
- ▶ Allow to completely dry naturally.
- ▶ Package, seal and label each item separately.

Blood stains on other surfaces (e.g. walls):

- ▶ If the item is large, cut out a portion, dry naturally, seal, label and submit. A swab can also be taken (see swabbing protocols). When swabbing suspected bloodstains, try to concentrate the stain onto

the swab tip. Avoid swabbing excess background material (dirt, debris, paint, etc.) from the material being swabbed. Use one swab per stain.

- ▶ Avoid scraping dry blood into envelopes. Dry blood may become airborne.

Liquid blood stains:

- ▶ Use a dry swab. Do not over saturate. See [swabbing protocols for dry area](#).

5. BONE/TEETH (DNA)

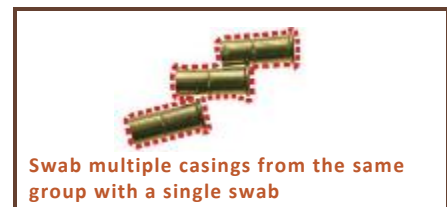
- ▶ Bone/teeth need to be pulverized prior to submission.
- ▶ Contact the Forensic Assessment Centre (FAC) for more information.

6. BUCCAL / MOUTH (DNA)

- ▶ After blood, the next preferred comparison sample is a buccal (mouth swab). See section on [comparison samples from known sources](#).
- ▶ When possible, known samples should be collected using the RCMP's Buccal Sample Warrant/Consent Collection Kit (blue bag), which has been prepared specifically for DNA warrant or consent sample collection.
- ▶ Swabbing the mouth allows for the collection of epithelial cells from the lining of the mouth.
- ▶ Have the individual rinse his/her mouth with water twice before collecting the sample in order to remove excess saliva.
- ▶ Use one dry sterile swab to thoroughly rub the inside of the cheeks, tongue and gums using an up and down motion.
- ▶ Allow time for the swab to dry completely.
- ▶ Package, seal and label each known sample separately.
- ▶ Ensure the origin of the sample is clearly marked.

7. CARTRIDGES / CASINGS / BULLETS (DNA)

- ▶ Spent cartridges should be swabbed together when thought to have originated from the same firearm (i.e. those of the same caliber found in close proximity).



8. CIGARETTE BUTTS (DNA)

- ▶ Use clean forceps or gloves to collect the cigarette butt, if possible.
- ▶ If the cigarette butt is wet or damp, allow to dry completely.
- ▶ **DO NOT** swab. Submit "as is".
- ▶ Package, seal and label each item separately.



9. CLOTHING / FABRIC (DNA)

- ▶ **DO NOT** swab as the DNA is difficult to recover. Submit the item “as is” to NFLS.
- ▶ Allow time for stains to dry completely. Applying artificial heat (e.g. blow dryer) may damage the biological sample. Not allowing to dry fully or properly can cause bacteria to form, leading to the degradation of the biological sample.
- ▶ Handle each article of clothing separately.
- ▶ If the item is large (carpet, bed sheet), consult with FAC.
- ▶ Package, seal and label each article of clothing separately in paper bags.



10. CONDOMS (DNA)

- ▶ If intact, place a knot at open end to seal contents and submit to the laboratory as soon as possible.
- ▶ If broken or ripped, allow the condom to dry as much as possible and package, seal and label separately in a paper bag before submitting to the laboratory.
- ▶ Keep the intact or broken condom frozen, if possible.

11. DRINKING CONTAINERS / STRAWS (DNA)

- ▶ Skin cells can be located on drinking containers such as coffee cups, pop cans, milk/juice cartons, coffee lids and/or straws.
- ▶ Swab the area where skin cells are thought to be present as this provides the highest potential of DNA recovery (see diagram). Use one swab.



See [swabbing protocols](#).

12. ENVELOPES AND STAMPS (DNA)

- ▶ Whenever possible, submit the entire envelope to NFLS.
- ▶ Ensure that the envelope is dry before packaging.
- ▶ In cases where the envelope requires both fingerprinting and forensic DNA analysis, have the exhibit fingerprinted prior to its submission to NFLS. Advise the Forensic Assessment Centre (FAC).
- ▶ If handwriting analysis will be taking place (via private examiner), this may need to be done prior to fingerprinting. Ensure the examiner takes all necessary contamination prevention precautions.
- ▶ If the exhibit is required for other document examination, please specify this on form C-414.

13. ABORTED FETUS (DNA)

- ▶ When the abortion of the fetus has just occurred, the products of conception should be sent to NFLS as soon as possible.
- ▶ Refrigerate and ship immediately.
- ▶ **DO NOT** freeze products of conception unless the sample was already frozen at the time of the seizure. If already frozen, it should be kept frozen (avoid freeze-thaw-freeze).

- ▶ Package on ice and send to NFLS as soon as possible using expedited transport
- ▶ It is preferable not to place in formalin/formaldehyde or any other preservative.

14. FINGERNAIL (DNA)

- ① *Material from under the fingernail should be collected when the victim/complainant indicates that he/she scratched the assailant. Samples are collected from each hand separately.*
- ① *Swabbing fingernails is preferred, however, clippings are acceptable depending on the case.*

14 A. SWABBING FINGERNAILS

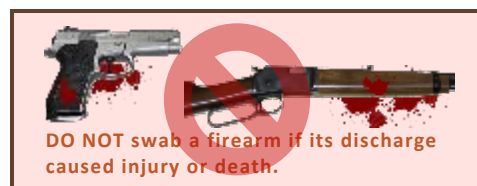
- ▶ Place two separate sheets of paper on a working surface where the swabbing will take place.
- ▶ Use one swab per hand.
- ▶ Moisten one side of a sterile swab with saline water (if not available, use distilled water or tap water).
- ▶ Place the victim/complainant's **right hand** over one of the pieces of paper and swab the area under each of the fingernails using the damp side of the swab. Turn the swab and go over the same areas with the dry side.
- ▶ Place the swab in its packaging, ensuring that it is properly closed and labelled right hand.
- ▶ Carefully fold the piece of paper to enclose any debris.
- ▶ Place the swab and folded paper in an envelope or container marked right hand.
- ▶ Repeat for **left hand**.

14 B. CLIPPING FINGERNAILS

- ▶ Place two separate sheets of paper on a working surface where the clipping will take place.
- ▶ Place the victim/complainant's **right hand** over one of the pieces of paper and clip the nails as close as possible to the fingertip using clean scissors or clippers.
- ▶ Fold the piece of paper with the clippings and place in a clean container.
- ▶ Label the container right hand.
- ▶ Repeat for **left hand**.

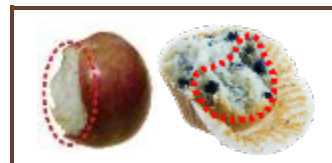
15. FIREARMS (DNA)

- ▶ **DO NOT** swab the firearm if its discharge caused injury or death – properly package and submit the firearm to NFLS for swabbing.
- ▶ If the firearm is a handled object (and not used on a person), it is acceptable to swab.
- ▶ Separate swabs should be taken from the following areas, depending on case particulars:
 - Trigger, trigger guard, hammer and safety
 - Action (slide, bolt, pump, etc.)
 - Stock or grip
 - Magazine(s)
 - All cartridges from within a magazine may be swabbed together
- ▶ See packaging and shipping of dangerous goods.



16. FOOD (DNA)

- ▶ Food may be considered for biological (DNA) analysis.
- ▶ When swabbing food items, freeze the item first, if possible.
- ▶ Swab the area where the food item was bitten (see [swabbing protocols](#)).
- ▶ When in doubt, contact the NFLS Forensic Assessment Centre.



17. FORK / SPOON (DNA)

- ▶ Skin cells can be located on items such as utensils used for food.
- ▶ Swab the area where skin cells are thought to be present as this provides the highest potential of DNA recovery (see diagram). Use one swab. See [swabbing protocols](#).



18. HAIR (DNA)

18 A. FROM KNOWN SOURCE

- ▶ After Blood and Buccal (mouth swab), hair is the next preferred comparison sample. See section on [comparison samples from known sources](#).
- ▶ When possible, known samples should be collected using the RCMP's Hair Sample Warrant/Consent Collection Kit (blue bag), which has been prepared specifically for DNA warrant or consent sample collection.
- ▶ Collect approximately 6-8 pulled scalp hairs with root sheaths. **DO NOT** cut hair.
- ▶ Place the hair in a folded sheet of paper and place in another appropriate container (envelope or plastic bag).
- ▶ Package, seal and label each known sample separately.
- ▶ Ensure the origin of the sample is clearly marked.

18 B. FROM UNKNOWN SOURCE

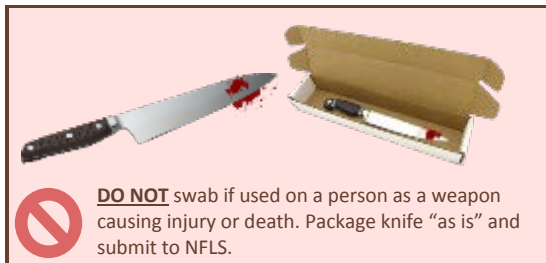
- ▶ In the event a hair or hairs are found at a crime scene, there may be an opportunity to submit these as exhibits for DNA analysis.
- ▶ Place the hair in a folded sheet of paper and place in another appropriate container (envelope or plastic bag).
- ▶ Package, seal and label each sample separately.
- ▶ Ensure the origin of the sample is clearly marked.

19. HUMAN REMAINS (DNA)

- ▶ If decomposition is minimal, routine comparison samples should be taken at autopsy. Consult with the coroner.
- ▶ If decomposition is extensive, have the following samples taken at autopsy:
 - A sample of deep muscle tissue (about an inch cube) – **DO NOT** put tissue in formalin or any preservative
 - Sample of bone including the marrow (about 3 to 4 inches long), preferably from a long bone or from a rib

- A few teeth, preferably molars
- ▶ Freeze sample(s) as soon as possible and keep frozen until submitted to NFLS.
- ▶ **Note on bone and/or teeth samples:** Bone samples must be pulverized before sending to NFLS. Contact the NFLS Forensic Assessment Centre (FAC) to obtain a list of service providers that offer bone pulverization services.

20. KNIFE (DNA)



- ▶ **DO NOT** swab the knife if it has been used on a person as a weapon – properly package and submit the knife to NFLS for swabbing. See packaging and shipping of sharp objects.
- ▶ If the knife is a handled object (e.g. used as a pry tool), the handle should be swabbed. When swabbing the handle, swab both sides using one swab.

21. SEMEN (DNA)

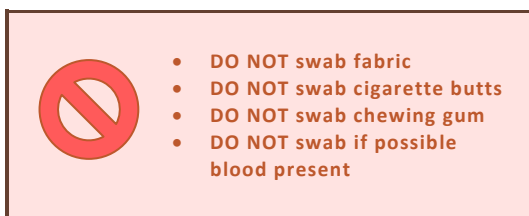
21 A. SEMEN FROM A VICTIM/COMPLAINANT (DNA)

- ▶ The healthcare practitioner will use a Sexual Assault Evidence Kit (SAEK) or equivalent to collect the samples required from the victim or complainant.
- ▶ SAEKs are generally sealed when handed over to police. Ensure the health care professional that is collecting the evidence provides you with a list of all the samples/exhibits in the SAEK because you will need to list all items on the request form (C-414) when submitting for analysis. Alternatively, you may break the seal in order to itemize the available exhibits.

21 B. SEMEN FROM ITEMS AT A CRIME SCENE (DNA)

- ▶ Semen stains can be found on the surface of objects or items (e.g. bedding, carpet).
- ▶ When dealing with an object that can be seized (e.g. clothing, bedding) and semen is thought to be present, **DO NOT** swab. Submit to NFLS as is.
- ▶ When dealing with an object that cannot be seized (e.g. wall, floor) and semen is thought to be present, swab the area and submit to NFLS. **DO NOT** swab fabric surfaces. Cuttings from areas of interest can be taken from fabric surfaces.
- ▶ See swabbing protocols.

22. SKIN CELLS (DNA)



- ▶ **DO NOT** swab fabric, cigarette butts, chewing gum as the DNA is difficult to recover. Package and submit “as is” to NFLS.
- ▶ **DO NOT** swab if there is possible blood present and submit “as is” to NFLS.
- ▶ Some common types of items where skin cells may exist include Break and Enter tools, jewelry, and cell phones.
- ▶ Swab the item where it is handled most.
- ▶ Use one swab.

23. TOOLS / WEAPONS (DNA)



- ▶ **DO NOT** swab a tool or weapon that has been used on a person to cause injury or death – properly package and submit the tool or weapon to NFLS for swabbing.
- ▶ If the tool or weapon is a handled object (and not used on a person), the handle should be swabbed separately.
- ▶ Carefully package the ends of tools to prevent loss of foreign material.
- ▶ Use plastic bags or styrofoam cups over the ends to prevent further damage to the tool and to retain any foreign material.
- ▶ Send tools in a tightly-packed box to prevent movement.
- ▶ See [packaging and shipping of dangerous goods](#).

■ COUNTERFEIT

1. BANK NOTES AND NEGOTIABLE INSTRUMENTS (COUNTERFEIT)

- ▶ Under Section 462 of the *Criminal Code*, the National Anti-Counterfeiting Bureau (NACB) has been delegated authority to be the central repository and point of disposition of all counterfeit money, counterfeit cheques and other negotiable instruments.
- ▶ All suspect counterfeit bank notes (Canadian, US and foreign currency) must be submitted to the NACB for examination and destruction.
- ▶ Before conducting a printing plant search, investigators are encouraged to contact the NACB to determine if a forensic specialist is available to attend and assist with the search. The presence of NACB personnel at the scene is beneficial to both the investigative unit and the NACB.
- ▶ All counterfeit exhibits are submitted directly to the [National Anti-Counterfeiting Bureau](#).

2. COINS (COUNTERFEIT)

- ▶ Submit all suspect counterfeit Canadian circulation coins to the National Anti-Counterfeiting Bureau (NACB) for examination.
- ▶ The NACB **DOES NOT** accept:
 - US coins
 - Foreign coins
 - Numismatic coins
- ▶ All counterfeit exhibits are submitted directly to the [National Anti-Counterfeiting Bureau](#).

3. COMPUTERS AND IT EQUIPMENT (COUNTERFEIT)

① *Computers and equipment should go to technological crime units*

- ▶ **DO NOT** move, unplug or alter the equipment.
- ▶ **DO NOT** allow the suspect (or other user) access to the computer.
- ▶ Ask the user to provide you with usernames and passwords, but do not attempt to login.
- ▶ Contact your local technological crime unit for assistance.
- ▶ When seizing, collect all wires, cables and related items.
- ▶ Modern printers may store electronic data relevant to an investigation. To prevent the possible loss of evidence, contact your local technological crime unit for assistance.
- ▶ Check if the printer has a ribbon. Used ribbon can be submitted to determine if impressions of the questioned text can be found.
- ▶ If the printer has interchangeable type elements, collect them all.
- ▶ All counterfeit exhibits are submitted directly to the [National Anti-Counterfeiting Bureau](#).
- ▶ **Comparison Sample:** Obtain samples of correspondence from files which were produced by the same equipment on or about the date of the questioned document, if possible. Label and place samples in paper envelopes.

4. PAYMENT CARDS (COUNTERFEIT)

- ▶ Submit all suspect counterfeit and/or payment cards to the National Anti-Counterfeiting Bureau (NACB).
- ▶ Forensic specialists may choose to examine a sampling of exhibits in large case submissions.
- ▶ Investigators should consult with counterfeit examiners at the NACB before sending seized equipment to the laboratory, including embossing machines encoders and tipping machines.
- ▶ **DO NOT** activate, adjust or alter equipment.
- ▶ Place payment cards and related printing materials in separate document protectors or plastic or paper envelopes.
- ▶ All counterfeit exhibits are submitted directly to the National Anti-Counterfeiting Bureau.

5. TRAVEL AND IDENTIFICATION DOCUMENTS (COUNTERFEIT)

- ▶ Suspect travel and identification documents include government issued identification such as passports, immigrations forms, citizenship cards, driver's licences, health cards and social insurance cards.
- ▶ All counterfeit exhibits are submitted directly to the National Anti-Counterfeiting Bureau.

■ FIREARMS AND TOOLMARK IDENTIFICATION

1. AMMUNITION, CARTRIDGES, BULLETS (FIREARMS/TOOLMARK)

- ① *If no blood is thought to be present on ammunition components, consider having a forensic identification specialist swab them. If blood is thought to be present, it is preferable to submit the relevant ammunition component to NFLS for swabbing.*
- ① *Contact your local forensic identification unit to arrange for the **fingerprinting** of casings, cartridges and guns prior to submitting to NFLS.*

1 A. UNFIRED AMMUNITION (FIREARMS/TOOLMARK)

- ▶ Any cartridge found in the chamber of a firearm should be itemized/packaged as a separate exhibit.
- ▶ Once removed from a magazine, unfired ammunition **MUST** be itemized/packaged as a separate exhibit. **DO NOT** attempt to load back into the magazine.
- ▶ Unfired ammunition **MUST** be packaged/shipped separately from firearms.
- ▶ For shipping of ammunition, you must follow Transport Canada's Transportation of Dangerous Goods Regulations. Improper transportation of dangerous goods is an offence.

1 B. FIRED AMMUNITION (FIREARMS/TOOLMARK)

- ▶ This includes the submission of cartridge cases, shotshells, shot pellets, shotshell wads, etc.
- ▶ All ammunition components must be itemized/packaged as separate exhibits.
- ▶ **DO NOT** use metal tools to remove bullets from bodies or objects (i.e. walls).
- ▶ Bullets, shot pellets, shotshell wads, etc. removed from bodies should be rinsed with water and dried before packaging.
- ▶ It is not necessary to remove all the shot pellets from a body, a representative sample will be sufficient for examination at NFLS.
- ▶ For shipping, wrap in tissue or some type of padding to prevent excessive movement
- ▶ Indicate "biohazard" on the C-414 for the exhibit if there is biological material present on the item.
- ▶ **Note:** Bullets or bullet fragments can often be located by X-rays. X-rays should be taken of a body or exhibit as projectile fragments may remain in the body even when both entrance and exit wounds have been identified. Most firearms sections, medical or veterinary facilities have X-ray equipment which can be used for locating projectiles in small objects. This would prevent the loss of forensically significant evidence and allow for the removal of small fragments with minimum damage.

2. BONE AND CARTILAGE (FIREARMS/TOOLMARK)

- ▶ Wounds on bone and cartilage may be examined to determine if the tool being submitted was used to inflict the damage.
- ▶ The medical examiner or pathologist will excise the bone or cartilage containing the wound
 - To preserve toolmarks on cartilage and bone, tissue samples are submerged in a (0.9%) saline solution.
- ▶ Refrigerate or freeze and send to NFLS as soon as possible.
- ▶ **Comparison Sample:** Collect associated items for comparison purposes, such as suspect tools.

3. CLOTHING (FIREARMS/TOOLMARK)

- ▶ Firearms analysis on articles of clothing can be submitted for impact damage assessment and range determination.
- ▶ When clothing is submitted for range determination it must be accompanied by photographs of the associated wounds and an autopsy report (if available at the time of submission).
- ▶ Avoid excessive handling of the clothing to ensure residue is not lost or transferred to other parts of the item.
- ▶ Collect only the outer layer of clothing that has possibly been penetrated by the projectile(s) or were in close proximity to the bullet path.
- ▶ Protect the area near the bullet hole and other areas suspected of bearing firearms discharge residue from contamination or contact with other parts of the clothing.
- ▶ Package each item of clothing separately to prevent a transfer of residue.
- ▶ Allow wet or moist clothing to dry naturally before packaging. Not allowing to dry fully or properly can cause bacteria to form. Do not use a blow dryer.
- ▶ Use paper bags to package clothing to prevent mould.
- ▶ Indicate “biohazard” on the C-414 for the exhibit if there is biological material present on the item.

4. FIREARMS (FIREARMS/TOOLMARK)

① *Fingerprinting or swabbing for DNA on any firearms related exhibits must be done prior to submitting to the firearms section.*

The Integrated Ballistics Identification System (IBIS) database can cross-reference firearms with fired ammunition components. Only CBSA firearms seizures can be directly submitted to the IBIS Section. You must first obtain authorization by the NFLS Forensic Assessment Centre (FAC) to submit fired ammunition components to IBIS.

- ▶ Unload and affix proper identification tags to the trigger guard of the firearm.
- ▶ **DO NOT** use adhesive labels, especially if the firearm is to be fingerprinted. These can remove the fingerprints.
- ▶ **DO NOT** handle or manipulate the firearm in any way that would affect testing at NFLS. This includes, but is not limited to:
 - test firing (for legal classification and functionality)
 - disassembly
 - trigger pull
 - shock discharge
 - serial number restoration
- ▶ NFLS will not conduct testing that has already been attempted by another laboratory or law enforcement agency.
- ▶ Contact the NFLS Forensic Assessment Centre (FAC) if the firearm was recovered from water or if the exhibit is excessively soiled. If necessary, the firearm can be cleaned as follows:
 - Rinse with hot water to flush off foreign material
 - Allow to dry naturally
 - Apply lubricant to metallic surfaces to protect against corrosion

- **DO NOT** use pull-throughs, brushes or other cleaning devices to clean the barrel or other metallic parts of the firearm
- ▶ Prior to shipping:
 - Firearms must be registered to the investigating agency. A Public Agency Identification Number (PAIN) must be obtained and can be found on the [RCMP public website](#).
 - Ensure the firearm is unloaded and safe for handling before shipping. A visible securing device should be used through the action (e.g. zap-strap, triggerlock).
 - If a firearm and magazines are seized together, these should be itemized/package as one exhibit.
 - If there is biological material present on the item, indicate “biohazard” on the C-414 submission form.
 - Ensure that firearms are transported in accordance with all federal and provincial regulations.

5. GUNPOWDER / PRIMER CAPS (FIREARMS/TOOLMARK)

- ▶ Keep gunpowder in its manufacturer’s container, when possible.
- ▶ Avoid contact with flame, excessive moisture, etc.
- ▶ For shipping bulk gunpowder, primer caps or other dangerous goods, please refer to Transport Canada’s [Transportation of Dangerous Goods Regulations](#). Improper transportation of dangerous goods is an offence.
- ▶ An explosive transport container is the only approved shipping container for non-initiated explosive samples.
- ▶ For an explosive transport container or for more information about transporting dangerous goods or other items, please contact the NFLS Forensic Assessment Centre prior to shipping exhibits.

6. OBLITERATED SERIAL NUMBER (FIREARMS/TOOLMARK)

- ▶ NFLS does not conduct serial number restoration if one has been previously attempted.
- ▶ If the item is difficult to transport, contact the NFLS Forensic Assessment Center to determine if a firearm specialists is available to attend the scene and conduct the restoration on site.

7. TOOLS (FIREARMS/TOOLMARK)

- ▶ This includes knives, bolt cutters, screwdrivers, pliers, saws, etc.
- ▶ **DO NOT** try to fit or place the tool in the toolmark. Keep tools isolated from the toolmarks that you suspect to be linked.
- ▶ Carefully package the ends of tools to prevent loss of foreign material.
- ▶ Use plastic bags or styrofoam cups taped over the ends to prevent further damage to the tool and to retain any foreign material.
- ▶ Send tools in a tightly-packed box to prevent movement.
- ▶ **Comparison Sample:** Collect associated items for comparison purposes.

8. TOOLMARK IMPRESSIONS (FIREARMS/TOOLMARK)

- ▶ **DO NOT** try to fit or place the tool in the toolmark. Keep tools isolated from the toolmarks that you suspect to be linked.
- ▶ Protect toolmarks from damage
- ▶ If possible, the object bearing the toolmark should be submitted.
- ▶ If the toolmark cannot be removed, contact the NFLS Forensic Assessment Centre for advice on making casts of the toolmark.
- ▶ If the toolmark cannot be removed and casts of the toolmark are not possible, remove portions of the exhibit containing the toolmarks. Clearly mark the toolmarks generated during the removal process.
- ▶ **Comparison Sample:** Collect associated items for comparison purposes, such as tools.

9. TIRES (FIREARMS/TOOLMARK)

- ▶ It is not necessary to submit the entire tire.
- ▶ Cut an area around the puncture or slash.
- ▶ **Comparison Sample:** Collect associated items for comparison purposes, such as the item used to puncture the tire.

10. WIRES (FIREARMS/TOOLMARK)

- ▶ Wires can be submitted and submitted to NFLS for analysis.
- ▶ Using some masking tape, identify the end that you cut - there is no need to mark or identify the suspicious end.
- ▶ **DO NOT** cover the suspect end with tape.
- ▶ Cover the suspicious end with loose protective packing.
- ▶ **Comparison Sample:** Collect associated items for comparison purposes.

■ TOXICOLOGY

1. BLOOD (TOXICOLOGY)

- ▶ Blood samples from a deceased will always be collected by a pathologist/medical examiner or designated assistant. Ensure the blood is obtained from an intact vessel (e.g. femoral vein). Pooled samples such as cavity fluid, pericardial fluid or chest blood should be avoided. Trauma to and/or decomposition of the body may require the submission of additional samples (e.g. heart blood, liver, vitreous humour, stomach contents).
- ▶ Blood samples from a **suspect or victim** will always be collected by a healthcare practitioner (e.g. at hospital).
- ▶ Advise the healthcare practitioner that the blood is being collected for toxicological analysis.
- ▶ Where possible, a Forensic Blood Collection Kit should be used. If unavailable, collect blood using two 10 mL grey-stoppered vacuum tubes.
- ▶ Grey-stoppered vacuum tubes contain anti-coagulants and preservatives. After the tube is sealed and labeled, invert the grey-stoppered vacuum tubes gently several times to mix contents.
- ▶ Samples taken at hospital (including serum/plasma) may be seized by warrant and submitted to NFLS for testing.
- ▶ Blood samples should be refrigerated and submitted to NFLS as soon as possible as some drugs can break down during storage.
- ▶ Ensure all vials are properly sealed and labeled.
- ▶ **Note on blood being submitted for drug-facilitated sexual assault:**
 - For alcohol analysis, blood samples collected more than 24 hours after the incident will not be accepted.
 - For drug analysis, blood samples collected more than 72 hours after the incident will not be accepted.

2. FOOD AND BEVERAGES (TOXICOLOGY)

- ▶ Food and beverage samples may be submitted for testing for alcohol, drugs or poisons.
- ▶ Collect in a leak proof container, seal and label.
- ▶ Store refrigerated and submit to the laboratory as soon as possible. Some drugs may break down during storage.
- ▶ **Comparison Sample:** Submit a known comparison sample, where possible (for example, a sealed bottle of the same brand of wine).

3. LIVER (TOXICOLOGY)

- ▶ Approximately 25 grams of liver tissue should be placed in a leak-proof container, sealed and labeled by the pathologist or coroner.
- ▶ Do not use a fixative or submerge the liver in any liquid.
- ▶ Refrigerate the sample and submit to NFLS as soon as possible as some drugs can break down during storage.

4. STOMACH CONTENTS (TOXICOLOGY)

- ▶ A sample of stomach contents should be placed in a leak-proof container by the pathologist or coroner.
- ▶ Refrigerate the sample and submit to NFLS as soon as possible as some drugs can break down during storage.

5. SYRINGES, PIPES, POWDERS, DRUGS, OR DRUG RESIDUE (TOXICOLOGY)

- ▶ Analysis to identify a controlled substance (e.g. as obtained from drug seizures) is not conducted at NFLS. Please contact [Health Canada's Drug Analysis Service](#).
- ▶ Drug paraphernalia can include syringes, pipes, powders, tablets/capsules, or other residues. These can be found at the scene and can be collected and submitted for analysis.
- ▶ For sharp objects (e.g. syringes, pipes) package each item in a rigid puncture-resistant container, seal and label.
- ▶ For powders, tablets or capsules, place in a plastic or glass vial, seal and label.
- ▶ All drug paraphernalia should be treated as biohazardous and labeled as such.
- ▶ Liquids should be collected in a leak-proof container.

6. URINE (TOXICOLOGY)

- ▶ Urine samples should be collected in a leak proof urine collection cup. Ensure cups are sealed, closed tightly and labeled.
- ▶ Urine samples can also be collected in 10 mL grey-stoppered vacuum tubes, sealed and labeled.
- ▶ Fill urine containers only $\frac{3}{4}$ full to avoid leakage during transport.
- ▶ If using a Doxtech™ Urine Specimen Collection Kit, disregard instructions that ask you to place the label *inside* the container. The label should be affixed *outside* the container.
- ▶ For alcohol analysis, urine samples collected more than 24 hours after the incident will not be accepted.
- ▶ For drug analysis, urine samples collected more than 72 hours after the incident will not be accepted.
- ▶ Samples must be refrigerated and sent to NFLS as soon as possible as some drugs can break down during storage.

7. VITREOUS HUMOUR (TOXICOLOGY)

- ▶ Vitreous humour refers to the transparent jellylike tissue filling the eyeball behind the lens.
- ▶ The medical examiner will collect the vitreous in a 10 mL grey-stoppered vacuum tube.
- ▶ Ensure the contents are sealed and labelled.
- ▶ Refrigerate the sample and submit to NFLS as soon as possible.

■ TRACE ANALYSIS

1. ACCELERANTS / IGNITABLE LIQUIDS (TRACE ANALYSIS)

- ▶ Send flammable liquids to the NFLS using shipping containers that comply with Transport Canada – see [Transport of Dangerous Goods Regulations](#).
- ▶ For small amounts of accelerant found in a container (e.g. jerrycan or solvent bottle), transfer the liquid to a new glass vial with a chemical resistant screw-cap lid (teflon-lined).
- ▶ For large containers of liquid, transfer 5 - 10 mL into a new glass vial with a chemical resistant screw-cap lid (teflon-lined).
- ▶ For empty containers suspected of containing an accelerant (e.g. empty jerrycan or bottle), package in an approved air-tight container in the same manner as for fire debris.
- ▶ Package and ship flammable liquids separately from any samples of fire debris or clothing that are to be examined for ignitable liquids.
- ▶ **DO NOT** store samples of flammable liquids in a conventional refrigerator or freezer. Vapor leakage could produce an explosion set off by the compressor motor.
- ▶ Personal items belonging to the suspect that contain or are believed to contain traces of ignitable liquid can be packaged in a sealed, tamper-proof evidence bags or folded and sealed in paper bags. An Ignitable Liquid Transport Container (ILTC) should be used for transport. See section on packaging [dangerous goods](#).
- ▶ **Comparison Samples:** All liquid samples must be packaged separately from any clothing or fire debris samples that may also be submitted.

2. ADHESIVE TAPE (TRACE ANALYSIS)

① **Fingerprinting** on any adhesive tape related exhibits must be done prior to submitting for trace analysis. Contact your local forensic identification unit for fingerprinting services. Advise the person who is fingerprinting that trace analysis will also be done and advise NFLS that the exhibit was first sent for fingerprinting.

- ▶ Tape from a crime scene may be compared to a roll of tape associated with the suspect or to pieces of tape from other scenes.
- ▶ Submit the tape for analysis without removing it from the taped object, if possible.
- ▶ If removal from taped object is necessary, handle ends of tape as little as possible to allow for possible physical matching. Place adhesive-side down onto a new document protector.
- ▶ If cutting the tape is necessary in order to remove it from the object/person, mark the cut ends with permanent marker.
- ▶ Do not separate or straighten pieces.
- ▶ Package in tamper-proof evidence bags or rigid plastic or metal containers.
- ▶ Do not package in paper or cardboard containers.
- ▶ **Comparison Samples:** In tamper-proof evidence bags, submit all partial rolls and pieces of tape that are similar in size, colour and texture. Do not mark or handle ends.

3. BANK DYE PACKS (TRACE ANALYSIS)

① **Exploding bank dye packs** are used by some banks to identify bank robbers. Disguised as a pack of bank notes, the pack is passed to a bank robber by the bank teller. Using a transmitter, the pack detects when the robber has left the bank and then it will emit a large cloud of red smoke and dye which will stain the bank notes, the robber's clothing, etc.

- ▶ Use extreme caution when handling these dye packs to prevent contamination.
- ▶ To avoid contamination, dye samples from suspects and those from the scene should be collected by different investigators.
- ▶ Samples from the scene should be double-bagged in tamper-proof exhibit bags and submitted separately from samples from suspects.
- ▶ Large surfaces such as the interior of vehicles can be swabbed using a gauze or cotton-tipped applicator that is wet with rubbing alcohol (isopropanol), methanol or acetone. If none of these solvents are available, then water may be used.
- ▶ Allow time for swabs to dry completely before packaging.
- ▶ Ensure that dye packs are made safe (i.e. no unexploded secondary packs, etc.) before moving exhibits or obtaining swabs.

4. BUILDING PRODUCTS (TRACE ANALYSIS)

- ▶ Fragments of building products, such as drywall, caulking, or tar may be found on clothing, tools, and vehicles, etc.
- ▶ Collect a comparison sample from the scene
- ▶ **DO NOT** attempt to remove particles from clothing or tools – submit these items “as is”.
- ▶ Collect particles from larger objects, such as vehicles, and submit in leak-proof containers, such as a plastic vials with tightly sealed lids or metal tins.
- ▶ **Comparison Samples:** Comparison samples should be collected from the damaged area(s) of the building. Package separately in leak-proof containers. Mark container as comparison sample.

5. CLOTHING (TRACE ANALYSIS)

5 A. CLOTHING WITH HAIR, PAINT OR OTHER FOREIGN PARTICLES (TRACE ANALYSIS)

- ▶ Wear a protection suit to prevent contamination – change suits for each suspect.
- ▶ Ensure the floor where the individual will undress is clean.
- ▶ Have each individual stand on a double stack of paper (at least two sheets) when removing clothing.
- ▶ Handle each item of clothing separately – take care to prevent any transfer of material between exhibits.
- ▶ Take care not to shake off any trace evidence adhering loosely to the garment.
- ▶ Ensure that fallen particles are captured on pieces of paper placed underneath the exhibits.
- ▶ If clothing is wet or moist, allow time for it to dry completely before packaging. Air-dry wet clothing from different individuals in separate rooms. **DO NOT** air-dry if the clothing is from an arson suspect and is to be tested for the presence of an accelerant.
- ▶ Package, seal and label each article of dry clothing separately in tamper-proof evidence bags or new, brown-paper evidence bags.

- ▶ Describe the location of any observed stains of interest on the accompanying form C-414. **DO NOT** place any marks directly onto the clothing.
- ▶ Also submit the upper sheet of paper where the individual was standing. Carefully fold the paper to retain loose debris. Package and label it in a separate sealed tamper-proof evidence bag or new, brown paper evidence bag. Discard the bottom sheet of paper that was in contact with the floor.
- ▶ If articles of clothing have been packaged together (e.g. when removed at hospital), leave them all together – do not repackage separately.
- ▶ If space is not available, wet exhibits may be packaged in tamper-proof evidence bags and submitted immediately to NFLS. Indicate on form C-414 that the clothing is wet.
- ▶ Clothing exhibits may also be frozen prior to submission.

5 B. CLOTHING FROM ARSON INVESTIGATION

- ▶ Immediately place clothing in large wide-mouth (2 L) canning jars or large (1-10 gallon) clean metal cans (new paint cans can be found at a local hardware store), or in a nylon bag.
- ▶ If using nylon evidence bags, secure with an air-tight heat-seal. Rolling down the top of the bag at least six times and then securing with packing tape will also provide an air tight seal.
- ▶ **DO NOT** air-dry if the clothing will be tested for the presence of ignitable liquids (e.g. solvents, fuels, or other volatiles). If the clothing is wet, seal it in a plastic bag (air tight seal) and freeze to prevent microbial action that will consume the ignitable liquids and retard mould growth.
- ▶ Freeze the clothing prior to submission, if possible.
- ▶ **Note:** Paper bags and ordinary plastic bags are not suitable for exhibits that are to be examined for the presence of accelerants.

5 C. CLOTHING WITH PEPPER SPRAY/TEAR GAS/IGNITABLE LIQUID

- ▶ Allow clothing time to dry completely. However, if the analysis is to detect for accelerants, clothing with ignitable liquids should not be dried.
- ▶ Package, seal and label each article of clothing separately in tamper-proof evidence bags or unused brown-paper evidence bags.

5 D. CLOTHING FOR GUNSHOT RESIDUE ANALYSIS

- ▶ See [Gunshot Residue \(Trace analysis\)](#).

6. DYES FOR FUEL MARKING (TRACE ANALYSIS)

① **Fuel marking dyes** are available for marking gasoline or diesel storage tanks and can assist in identifying the theft of fuel from these bulk storage tanks. The dye is not visible and will not harm internal combustion engines.

- ▶ To obtain the dye, contact the NFLS Forensic Assessment Centre with the following information:
 - Type of fuel
 - Volume of fuel to mark
 - Number of times the volume is to be marked
 - The location of the fuel tank
- ▶ After the fuel has been stolen, the investigator can seize a sample of fuel and:
 - test it in the field for an immediate result (there is a procedure to make the dye visible)
 - and/or send a sample to the lab for testing

- ▶ Collect three samples, 250 mL each, of:
 - The suspect fuel from the marked storage tank
 - Any claimed source of the suspect fuel
- ▶ For more information, see [Accelerants / ignitable liquids \(Trace analysis\)](#).

7. EXPLOSIVE DEBRIS (TRACE ANALYSIS)

- ▶ Refer and cross-reference with [Explosive Substances \(Trace Analysis\)](#).
- ▶ Contact your nearest Explosive Disposal Unit (EDU) so that the scene can be searched for secondary explosives and/or hazardous devices (chemical, biological, radiological and nuclear).
- ▶ Have your local forensic identification services and the EDU locate the seat of the blast and collect debris from this location.
- ▶ Following the instructions of the EDU, search outward from the seat of the blast in a systematic pattern and collect pieces of debris.
- ▶ Place explosive debris in air-tight containers, such as canning jars, nylon evidence bags and metal cans.
- ▶ Remove any non-initiated explosive substance from the debris and send it separately.
- ▶ Be alert for metal fragments, tape fragments, pieces of wire, fragments of explosive wrappers (paper or plastic), clock mechanism parts, fuse, battery parts – collect and package separately.
- ▶ **Comparison Samples:** Control samples and items from any suspect should be packaged and kept separate from scene debris samples and sent separately to NFLS. Non-initiated explosives from the scene and any seized non-initiated control samples from a suspect can be sent in the same Explosive Transport Container (ETC).

8. EXPLOSIVE DEVICES (TRACE ANALYSIS)

- ▶ **DO NOT TOUCH.**
- ▶ Contact the nearest Explosives Disposal Unit (EDU) to render the device safe.
- ▶ Device components (power sources, timing units, wires, blasting cap) may be examined by local EDU.
- ▶ Place samples that are being submitted to NFLS for explosive analysis in air-tight canning jars.
- ▶ If a non-initiated explosive substance is found and analysis is required, refer to [Explosive Substances \(Trace Analysis\)](#).
- ▶ Certain items found can be sent to NFLS for both explosives and DNA examination, namely fragments that a suspect may have handled by contact. Examples would include: container fragments, tape, device concealment packaging, switches or string. Such items should be packaged to preserve the priority evidence. If DNA is the priority, the exhibit should be packaged in a paper bag first, then inserted inside a sealed air-tight container.
- ▶ Reserve tape, paper, etc. for fingerprinting in metal cans or glass jars.
- ▶ **Comparison Samples:** Package and keep separate from questioned items. Non-initiated explosives from the scene and any seized non-initiated control samples from a suspect can be sent in the same Explosive Transport Container (ETC). Refer to [Explosive Substances \(Trace Analysis\)](#). Send separately to NFLS.

9. EXPLOSIVE SUBSTANCES (TRACE ANALYSIS)

- ▶ Contact the nearest Explosives Disposal Unit (EDU) for assistance in determining the stability of the explosive.
- ▶ Send no more than 10 grams of each non-initiated explosive to NFLS using the following procedure:
 - Contact the NFLS Forensic Assessment Centre (FAC) to obtain the Explosive Transport Container (ETC) which is the only approved shipping container for non-initiated explosive samples.
 - Following the instructions provided with the ETC, use the teflon vials provided in the ETC shipping container and package the explosive in 10 gram quantities per vial and place in the ETC.
 - Nitroglycerine must be diluted 1:10 with methanol (methyl hydrate) before submitting in the ETC.
 - Complete the documentation exactly as indicated in the instructions provided with the ETC and ship to NFLS by courier.
 - Contact the NFLS Forensic Assessment Centre before shipping the ETC.
- ▶ **Comparison Samples:** Non-initiated explosives from the scene and any seized non-initiated control samples from a suspect can be sent in the same ETC – refer to Explosive Substances. If non-initiated explosives are involved, an ETC must be used for shipping.

10. FIRE DEBRIS (TRACE ANALYSIS)

- ▶ Place fire debris in clean, lined or unlined metal cans or in wide-mouth canning jars or in nylon bags. The can or jar must be unused, direct from supplier with lid on. If submitting debris in the canning jar, ensure the rubber seal on the lid of jar is not inverted.
- ▶ **DO NOT** re-use other types of jars, such as pickle or jam jars.
- ▶ Exhibits that cannot be reduced to fit into large canning jars or large paint cans (10 L or 20 L) may be packaged in nylon bags or other special bags sold for packaging fire debris.
- ▶ Cut up large pieces of debris and fill container one-half to two-thirds, leaving at least 3 to 5 cm of space at the top of the can or jar free of debris.
- ▶ **DO NOT** dry exhibits before packaging.
- ▶ Exhibits may be stored in an explosion-proof refrigerator or freezer prior to submission.
- ▶ Package and ship separately from liquids and suspected accelerants.
- ▶ If a swab (e.g. gauze pad) is used to soak up a liquid at a fire scene, package the swab in a new metal paint can, or glass canning jar as described above. An unused swab should also be packaged separately and sent in as a control sample.

11. GUNSHOT RESIDUE (TRACE ANALYSIS)

- ▶ Contact the NFLS Forensic Assessment Center to receive a Gunshot Residue (GSR) Kit. It contains instructions, a collection form, and two boxes each containing a pair of disposable gloves, a label, and two sample vials.
- ▶ To get a sample from the hands and/or face of a suspect, or the interior of a vehicle, follow the instructions in the Gunshot Residue (GSR) Kit. If a kit is not available, contact the NFLS Forensic Assessment Centre for further instructions.
- ▶ Do not collect GSR samples if the item (e.g. piece of clothing) can be submitted to NFLS for GSR testing by a specialist.
- ▶ When collecting articles of clothing from suspects, submit outermost layer of clothing only. Ensure that each item is packaged separately in paper bags.

- ▶ Obtain samples soon after the shooting as possible.
- ▶ The following types of exhibits will **NOT** normally be accepted:
 - GSR samples from the face and/or hands of suspected shooters more than twelve hours after the shooting incident
 - GSR samples from the face and/or hands of shooting victims
 - Articles of clothing from shooting victims
- ▶ If you feel exceptional circumstances exist for analysis of the above noted, contact the NFLS Forensic Assessment Centre.

12. METALS (TRACE ANALYSIS)

- ▶ Request an elemental analysis to determine sample composition and possible sources (e.g. metal filings, metal fragments from fire and explosion scenes).
- ▶ Submit suspect samples in tamper-proof exhibit bags.
- ▶ For metallurgical examinations (e.g. metal fatigue), contact the NFLS Forensic Assessment Centre to provide a potential list of metallurgists.
- ▶ **Comparison Samples:** Submit comparison samples in tamper-proof exhibit bags.

13. PAINT (TRACE ANALYSIS)

① *During an investigation, you may come across paint in three different forms:*

- **vehicle paint** – NFLS can provide make/model and year information from paint left at a crime scene such as a break and enter (where a car smashed through a door, gate, wall, etc.) or a hit and run scene from plastic parts left at the scene, or on a pedestrian's clothing, bicycle etc.
- **architectural paint** – NFLS can conduct comparisons of: 1) paint transferred to an object (e.g. door, window) from a painted tool; and 2) paint transferred to a tool from an object on which the tool was used.
- **spray paints** – NFLS can compare spray paint on a vandalized wall or vehicle (e.g. graffiti epitaphs at homicide scenes) to a spray paint can seized from the suspect.

- ▶ If foreign paint is present on an object, submit the entire object to NFLS. If it is not practical to submit the entire object, **DO NOT** attempt to separate the foreign paint from the surface of the object. Instead, cut out a portion of the object around the foreign paint and submit to NFLS. If the object is too large to submit or the object cannot be cut, remove the foreign paint and include any underlying paint layers as one sample.
- ▶ Remove each paint sample with a new, disposable scalpel, being careful to obtain all layers of paint present.
- ▶ Submit scalpel with the sample.
- ▶ Package each sample in a piece of folded paper, a leak-proof metal canisters, or a plastic vial. Place inside a sealed canister, plastic evidence bag or envelope.
- ▶ Submit parts of the damaged material if possible, especially if smearing is present (e.g. bumper extensions, parts of door frames).
- ▶ Submit entire articles of clothing when paint smears are suspected.
- ▶ **DO NOT** use adhesive tape to lift paint or to store a sample of the paint.
- ▶ Submit liquid paint samples in paint tins or place on a glass slide, dry and submit.

- ▶ Liquid samples (e.g. aerosol paint canisters) must be shipped in accordance with the [Transportation of Dangerous Goods Act](#).
- ▶ **Comparison Samples:** Take separate paint samples from all damaged areas of vehicles, buildings (e.g. door frame), fences, posts, safes, etc. Use a new scalpel for each sample and package each sample separately, as described above, taking care to avoid contamination between samples. Include the VIN, make, model and year of each vehicle sampled and the location of each sample.

14. PHYSICAL MATCH (TRACE ANALYSIS)

① **A physical match** between two objects can provide conclusive links between a suspect and a crime scene. For example, motor vehicle parts left at a hit and run scene may be physically matched back to a suspect's vehicle; or, a piece of tape recovered from a victim of a home invasion may be physically matched back to a roll of tape in the suspect's possession.

- ▶ NFLS may provide assistance in the physical matching of a variety of materials, including adhesive tapes, plastic parts, large paint chips, glass containers, or metal foil.
- ▶ Carefully package broken material in leak-proof containers in such a way that protects the edges.
- ▶ There are specific instructions for packaging adhesive tape seized from a crime scene. Refer to [Adhesive Tape](#).
- ▶ **Comparison Samples:** Include rolls of tape, plastic parts, paint chips, glass containers, metal foil, or other materials believed to be the source of the questioned item(s). Package separately from questioned samples and ensure that edges of the item(s) are protected from further damage. Refer to [Adhesive Tape](#) for instructions on correct packaging.

15. SAFE INSULATION (TRACE ANALYSIS)

① **Safe insulation** is a light, easily fractured mortar-like material used by safe manufacturers. Often safes are broken into by cutting into the wall of the safe. Cutting through the wall of safe will release the safe insulation causing particles to be dispersed on the suspect's clothing, tools, vehicle, and/or residence. Many of the particles of safe insulation will be microscopic and so the suspect may not even be aware that they are present.

- ▶ Package materials containing suspected samples of safe insulation – such as clothing, footwear, vehicles, floor mats, and tools – in tamper-proof evidence bags or new, brown-paper evidence bags.
- ▶ For suspected safe insulation material found on larger objects, such as vehicle interiors, truck beds, or truck liners, manually recover as much material as possible and package in tamper-proof evidence bags or new, brown-paper evidence bags.
- ▶ Refer to [clothing](#) and [tools](#) for packaging instructions.
- ▶ **Comparison Samples:** Collect samples of safe insulation from each damaged area of the safe. Package in leak-proof vials, tins and seal in tamper-proof evidence bags. Keep separate from clothing and tools. Include information about make, model, year and serial number of the safe on FAC submission form, C-414.

16. TOOLS (TRACE ANALYSIS)

① *Tools may be used to pry or cut an object at a crime scene, including screwdrivers, pry bars, pliers, bolt cutters, knives, and saws. Paint may be transferred from a door, window, safe, etc. to a tool, and/or paint from a tool may be transferred to the object being pried or cut open.*

- ▶ Carefully package the ends of tools to prevent loss of foreign material.
- ▶ Use plastic bags or styrofoam cups taped over the ends to prevent further damage to the tool and to retain any foreign material.
- ▶ Send tools in a tightly-packed box to prevent movement.
- ▶ For sharp objects, see packaging for [sharp objects](#).
- ▶ **Comparison Sample:** Collect associated items for comparison purposes.



17. UNKNOWN LIQUID OR POWDER (TRACE ANALYSIS)

- ▶ Contact the NFLS Forensic Assessment Centre (FAC) for instructions on how to process suspected CBRN materials.
- ▶ Submit in glass vials or bottles with teflon-lined screw cap closures (wide-mouth sample containers can be purchased).
- ▶ Submit the entire sample unless it exceeds 250 grams (about 1 cup) of solid material or 500 mL (about 2 cups) of unknown liquid.
- ▶ If only a small amount of powder is available, for example, powder mailed in an envelope, do not attempt to remove the powder from the envelope. Package entire envelope and its contents in a leak proof plastic evidence container or bag.
- ▶ USE glass containers to sample possible CBRN materials.
- ▶ **DO NOT** use metal cans, plastic vials or plastic bags to sample possible CBRN materials.
- ▶ Decontaminate the outside of the sample container after filling and before packaging for submission by wiping it with a towel moistened with water or rubbing alcohol.
- ▶ Seal all samples in a tamper-proof evidence bag.

18. VEHICLE PARTS (TRACE ANALYSIS)

① **Caution:** *If airbags did not deploy during the collision, they are still armed and could deploy when you lean into the car, causing injury or death.*

- ▶ If a physical match is to be attempted from parts left at a scene to a suspect vehicle, protect the broken ends of molding, aerials, lens, trim, etc. Refer to [Physical Match](#).
- ▶ It may be possible to identify the make/model and year of a motor vehicle from a painted part left at the scene. Refer to section on [Paint](#) for packaging requirements.

SUBMITTING EVIDENCE



NOTE ON FINGERPRINTS: Almost all exhibits, including firearms or ammunition, could have fingerprints. Fingerprints should be processed before the exhibit is sent to the RCMP's National Forensic Laboratory Services (NFLS). If a fingerprint examination is needed, consult with your local forensic identification unit before submitting exhibits. Some possible exceptions include exhibits where trace evidence could be lost with fingerprinting.

CONTACT THE FORENSIC ASSESSMENT CENTRE

All requests for service to NFLS must go through the Forensic Assessment Centre (FAC) for authorization prior to the submission of exhibits. The **only exception** is for counterfeit submissions, which go directly to the NFLS National Anti-Counterfeiting Bureau.

Following is a general outline of the submission process:

1. Complete service request form C-414, *Request for Forensic Laboratory Analysis*. It can be found by RCMP members on RCMP Forms or contact FAC. Other forms may be required for toxicology service requests
 - a. For Drug Evaluation and Classification Program (DECP) cases, complete the C-414 and the DECP face sheet signed by an instructor.
 - b. For impaired driving cases use the Toxicology Services Analysis Request Check Sheet – Impaired Driving Cases.
 - c. For all other submissions, complete a *Toxicology Services Check Sheet – Sexual Assault, Homicide, Drug Screening Cases*.
2. Send the completed C-414 and applicable check sheet to the FAC by email (preferred) FAC-CEJ@rcmp-grc.gc.ca or by fax 1-877-243-5047.
3. A FAC representative will contact you to authorize the service request or discuss the file. This may include discussion about exhibit selection and prioritization of exhibits.

THE NATIONAL ANTI-COUNTERFEITING BUREAU

Submit suspected counterfeit bank notes, negotiable instruments, travel and identity documents and payment cards directly to the National Anti-Counterfeit Bureau (NACB). Depending if the evidence is required in court will determine what form to complete.

When evidence is required for court:

- Complete service request form C-414, *Request for Forensic Laboratory Analysis*. Provide details of the occurrence and a clear indication that the analysis is required for court purposes. Specify date of court proceedings, if known.
- To avoid interfering with the forensic examination, do not place any markings on the exhibits (e.g. never write 'counterfeit' or 'fake' on any exhibit).

- If fingerprint analysis is needed, submit exhibits to the NACB first and indicate special handling is required. (Note: all fingerprinting must be done at your location).
- Please ensure that you include your email address.
- Seal exhibits in an exhibit bag and mark with initials and date.
- Forward your exhibits along with a copy of Form C-414 to the NACB.
- Results for all banknote submissions include: a laboratory report; a Certificate of Examiner of Counterfeits and/or an affidavit; and a Notice of Intention to Produce Certificate and/or an affidavit.

When no criminal charges are anticipated:

- When no criminal charges are anticipated and there are no suspects identified at time of submission, exhibits will be processed as a “non-court” submission.
- Complete form 3774 (contact NACB@rcmp-grc.gc.ca for the form) and provide details of the occurrence.
- Forward your exhibits along with a copy of Form 3774 to the NACB.
- *Note:* All non-court submissions are retained at the NACB for a minimum period of 6 months after which they are destroyed. If a suspect is identified during the retention period, please notify the NACB and notes will be treated as evidence for court.

TO SUBMIT NACB EXHIBITS:

BY COURIER

*National Anti-Counterfeiting Bureau
NPS Building, Loading Dock #1
1200 Vanier Parkway, Ottawa ON K1A 0R2*

BY REGISTERED MAIL OR PRIORITY POST

*National Anti-Counterfeiting Bureau
1200 Vanier Parkway,
Ottawa ON K1A 0R2*

POST FORENSIC ANALYSIS

RETURN OF EXHIBITS AND FILES

All exhibit material, reports and documentation resulting from their examination by the RCMP's National Forensic Laboratory Services (NFLS) belong to the submitting agency. All exhibits submitted to NFLS are returned to the agency, including all NFLS generated sub-samples (e.g. cuttings, DNA extracts, swabs). Exceptions include exhibits consumed in analysis and uninitiated explosives. Also, ammunition components retained in archive for possible future comparison to cases linked via CIBIN matches are exempt. If ammunition components are required for court purposes, it is your responsibility to contact the NFLS Forensic Assessment Centre (FAC) to initiate exhibit return.

NFLS does not retain exhibit material, reports and related documentation indefinitely. Once returned, NFLS will have no information available to aid in future analysis. It is the agency's responsibility to ensure retention of exhibit material and related documents according to its policies. If further forensic examination is required, it is the responsibility of the lead investigating agency to submit and/or re-submit exhibits and related documentation for further analysis.

DISPOSAL OF COUNTERFEIT EXHIBITS

As the result of an agreement between the Minister of Finance and the RCMP, the authority for disposal is delegated to the Commissioner of the RCMP. Thus, the NACB assumes responsibility for destroying all counterfeit notes (when the notes are no longer needed or are not required for court).

DISCLOSURE

Disclosure of NFLS documents prior to their return to the submitting agency can be requested by contacting the Forensic Assessment Centre (FAC). In consultation with the Crown Attorney, complete the Request for Disclosure form which can be obtained from FAC.

NFLS requires 30 days' notice in order to provide documents. Please use the latest request form.

OTHER FORENSIC RESOURCES

This guide pertains exclusively to National Forensic Laboratory Services (NFLS), however, investigators should be acquainted with other local points of reference and forensic services that are available to them. Following are some additional resources to consider:

NATIONAL DNA DATA BANK OF CANADA

The National DNA Data Bank (NDDB) stores DNA profiles recovered from crime scenes and from convicted offenders. When investigators submit biological (DNA) evidence to NFLS, the DNA profiles developed from the crime scenes are uploaded and compared within the NDDB.

Convicted offender biological samples are collected and submitted directly to the NDDB. To ensure the integrity of the NDDB, the DNA Identification Regulations stipulate that the NDDB can only accept a biological sample that has been collected with a Convicted Offender DNA Database Sample Collection Kit (clear bag). For more information about these sample kits, contact the [NDDB by e-mail](#).

For a list of DNA designated offences or for other NDDB forms, including Form 5.01 – *Information to Obtain a Warrant to Take Bodily Substances for Forensic DNA Analysis*, visit the [NDDB website](#).

NDDB, DNA COLLECTION KITS

- To request an NDDB sample collection kit, please contact the [NDDB by email](#).
- NDDB DNA collection kits are available for blood, buccal or hair samples.
- The use of any other collection kit will cause the sample to be rejected.
- RCMP Detachments may also contact Divisional Stores directly.

FORENSIC IDENTIFICATION UNITS

Forensic identification is an area that provides essential support to criminal investigations, including bloodstain pattern analysis, crime scene examination for physical evidence such as fingerprints, and footwear or tire impressions. Specialists in these units can attend crime scenes or can be called upon to provide advice on the collection and packaging of evidence. Refer to your local point of contact.

TECHNOLOGICAL CRIME UNITS

Technological crime units assist investigators with forensic analysis on various pieces of equipment such as computers, smart phones, tablets or other sophisticated technical products. Refer to your local point of contact.

EXPLOSIVES DISPOSAL UNITS

Explosive disposal units provide expertise in relation to the handling of explosives and the investigation of post blast scenes. They can assist in the examination and rendering 'safe' of suspicious packages and improvised explosive devices including the disposal of military ordnance

and ammunition. Many units are responsible for first response to CBRN-E (Chemical, Biological, Radiological, Nuclear, Explosives) events. Refer to your local point of contact.

FIREARMS REFERENCE TABLE

The Firearms Reference Table (FRT) is produced by the Canadian Firearms Program and incorporates both text and images, which aids investigators in the identification of firearms. For assistance or to request a copy of the FRT, send an [email](#) to Canadian Firearms Program or contact 1.800.731.4000, ext.1082.

NATIONAL WEAPONS ENFORCEMENT SUPPORT TEAM (NWEST)

The National Weapons Enforcement Support Team (NWEST) offers personnel and resource support to law enforcement agencies across the country on all aspects of firearms investigations and prosecutions. Refer to your local/regional point of contact.

NATIONAL CENTRE FOR MISSING PERSONS AND UNIDENTIFIED REMAINS (NCMPUR)

NCMPUR assists law enforcement agencies, coroners and medical examiners by providing information sharing through a national database and [public website](#) as well as training, investigational advice and case analyses.