



Handbook of Forensic Science



Office of the Director



Since its 1932 inception, the FBI Laboratory has consistently strived to enhance its service to the law enforcement and criminal justice communities. The Handbook of Forensic Science includes information to clarify the capabilities of the FBI Laboratory, as well as current techniques used to examine physical evidence.

Through exhaustive analysis, our technicians develop appropriate methodology to apply the most recent scientific and technological innovations to the examination of forensic evidence in criminal investigations. The reliability of these techniques is crucial, not only to the law enforcement profession, but also to the public we serve. The men and women who collect physical evidence at crime scenes must exercise prudent care in its handling and packaging in order to preserve its integrity. By doing so, they help to ensure that the results of laboratory examinations are accurate. Suggested guidelines and procedures are included in this manual.

The FBI distributes the Handbook of Forensic Science in its continuing efforts to assist crime investigators and laboratories throughout the world. I hope that this publication will promote optimum use of forensic evidence and crime laboratories. These are essential components in facilitating the successful resolution of the high number of investigations and prosecutions which overwhelm the criminal justice system and tax our resources at all levels of government.

A handwritten signature in black ink that reads "Louis J. Freeh". The signature is written in a cursive, flowing style.

Louis J. Freeh
Director

Handbook of Forensic Science





The FBI Laboratory is located in the J. Edgar Hoover FBI Building,
10th and Pennsylvania Avenue, Northwest, Washington, D.C. 20535

Building on a Tradition of Excellence

VISION STATEMENT OF THE FBI LABORATORY

*T*he FBI Laboratory will be foremost in the delivery of forensic examinations and other services to LAW ENFORCEMENT through:

- ▶ **A total commitment to quality**
- ▶ **Technical leadership**
- ▶ **Prompt, accurate, and thorough response to all requests**
- ▶ **Innovative uses of technology to facilitate *INVESTIGATIONS***
- ▶ **Sharing information and technology with the *CRIMINAL JUSTICE COMMUNITY***
- ▶ **A work environment which fosters open communication, creativity, individual initiative, and personal achievement**

Table of Contents

Introductory Remarks	iii
Vision Statement of the FBI Laboratory	vi
General Information	viii - ix
Safety and The Crime Scene	2
Basic Safety Guidelines	3
The Crime Scene	14
FBI Forensic and Technical Support Services	20
Document Services	21
Computer Analysis and Response Team (CART)	22
Linguistics Examinations	22
Questioned Documents	23
Shoe Print and Tire Tread Examinations	29
Racketeering Records Analyses	33
Latent Fingerprint Services	35
Forensic Science Research and Training Center (FSRTC)	41
Scientific Analysis Services	43
Chemical - Toxicological Examinations	44
DNA Analysis/Serology Examinations	48
Explosives (Examinations, Guidelines, etc.)	53
Firearms-Toolmarks Examinations	57
Hairs and Fibers Examinations	65
Materials Analyses	67
Special Projects Services	76
Graphic, Photographic, Structural, and Video Services	77
Technical Services	79
Audio/Video and Electronic Devices	80
The National Center for the Analysis of Violent Crime	82
Bomb Data Center	84
Criminal Justice Information Services (CJIS)	85
Packing and Shipping Evidence	91
Collection, Shipment, Identification, and Packaging Charts	98
Index	116
Publication Rights	

General Information

Definitions of Evidence

That which is legally submitted to a competent tribunal as a means of ascertaining the truth of any alleged matter of fact under investigation.

Anything a suspect has taken from, left at, or that may be otherwise connected with the crime scene or the crime itself.

Terminology

Laboratory, latent, physical, and tangible, are all adjectives that describe the types of evidence received at the FBI to be examined by our experts.

Laboratory evidence is subjected to scientific testing.

Latent evidence, usually hidden (undeveloped), is evidence that becomes visible by means of the forensic technology.

Physical evidence (normally inanimate) may be measured to determine its quantity or quality.

Tangible evidence can be touched and/or defined.

Purpose of Physical Evidence

Physical evidence aids in the solution of the case by:

- Connecting or eliminating suspects
- Developing or identifying suspects
- Developing or showing a similar method of operation
- Identifying loot or contraband
- Proving or disproving an alibi
- Providing leads

Physical Evidence Proves an Element or Theory of an Offense, for example:

- Bullets, residue at the scene of a fire, toolmarks, blood, semen, or stomach contents may all prove elements of certain offenses;
- Footprints may show that many were at the scene, and/or auto paint on clothing may show that a person was hit by a car instead of otherwise injured;
- Safe insulation, glass, or building materials on a suspect's clothing may prove entry;
- Safe insulation on tools may be sufficient to prove violation of statutes for possession of burglary tools.

Nature of Physical Evidence

Physical evidence falls into two classifications:

- Evidence with Individual Identifying Characteristics and
- Evidence with Class Characteristics only.

Evidence with individual identifying characteristics can be positively identified as coming from a specific source or person if sufficient identifying characteristics are present. For example: bullets, finger/shoe prints, handwriting, toolmarks, and pieces of glass where the broken edges can be matched, and wood where broken/cut surfaces can be matched.

Evidence with class characteristics only, no matter how thoroughly examined, cannot be placed into another class. A definite identification becomes impossible when more than one source is found in samples, or when microscopic/accidental markings are insufficient for positive identification on soil, blood, hairs, fibers, single-layered paint from a safe or car, glass fragments too small to match broken edges, and toolmarks, finger/shoe prints, or bullets.

The value of evidence with Class Characteristics only should not be minimized. In cases involving evidence with Class Characteristics, be alert for the following:

- Preponderance of such evidence;
- Evidence such as paint with several matching layers, or soil with foreign matter such as paint chips, odd seeds, and safe insulation;
- Elimination evidence, such as soil specimens from where a suspect claims he/she was; where he/she claims a car was; or paint or other materials from a source mentioned in an alibi.

Standard Reference Files and Collections

The FBI Laboratory maintains these collections so that evidence may be compared to the following standard files:

Adhesives
Ammunition
Checkwriter Standards
Duct Tape/Electrical Tape
Explosives and Related Items
General Rifling Characteristics
Hairs and Fibers
National Automotive Image File
National Automotive Paint File (Foreign and Domestic)
National Motor Vehicle Certificate of Title
National Motor Vehicle Altered Numbers File
National Vehicle Identification Numbers (VIN) File
Office Equipment Standards (typewriters, copiers, printers, etc.)
Reference Firearms Collection
Safe Insulation
Safety Paper Standards
Shoe Sole Design Standards
Tire Tread Design Standards
Watermark Standards

Files of Questioned Material include:

Anonymous Letters
Bank Robbery Notes
Fraudulent Checks

All forensic services, including the services of laboratory examiners if needed as expert witnesses, are rendered free of cost to contributing agencies.

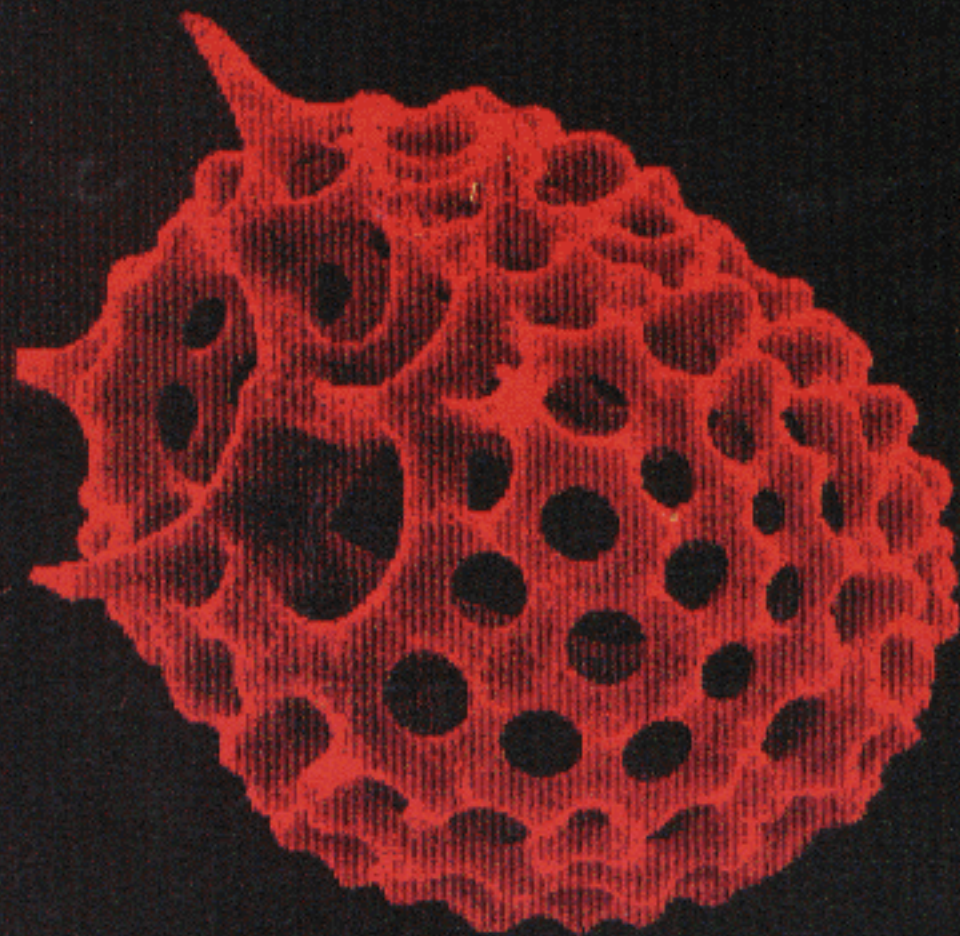
As a general rule, the FBI will not conduct forensic examinations if the evidence is subjected elsewhere to the same examination for the Prosecution. However, if the circumstances in a given instance are such that this restriction poses a significant obstacle to an orderly prosecution, these facts should be set forth in a request for waiver. Such requests will be evaluated on a case-by-case basis.

To utilize more efficiently its resources, the Laboratory Division will not accept cases from other crime laboratories which have the capability of conducting the requested examination(s). If submitted, the evidence will be returned unopened and unexamined. However, mitigating circumstances may warrant an exception to this policy, such as fingerprint examinations.

In certain situations, fingerprint evidence will be examined even if it is subjected to examination by other fingerprint experts. FBI experts will furnish testimony regarding evidence they have examined. But, in the interest of economy, their testimony should not be requested if another Prosecution expert is already testifying to the same results.

Facilities are available to all federal agencies, U.S. Attorneys, and military tribunals in both civil and criminal matters, and all duly constituted state, county, and municipal law enforcement agencies in the United States in connection with their official criminal investigative matters only.

2-RADIOLARIA-7



MAG = 1200X
20.79 MICRONS

RADIOLARIA (Magnified 20.79 microns) Marine planktonic protozoan recovered from evidence to determine environmental history

Safety
and the
Crime Scene

Basic Safety Guidelines for Crime Scene Investigation and Evidence Collection

Laboratory examiners, photographers, evidence response team members, evidence technicians, fingerprint specialists, and others are often called upon to conduct crime scene searches and to identify bodies in mass disasters. Because of the inherent risk of exposure to human blood and other potentially infectious materials, as well as the various physical hazards present at the crime scene, the health and safety of these individuals may be compromised. For protection, it is essential that they develop and maintain an acute awareness of the hazards present in their work environment and take the necessary precautions and measures to protect themselves and their coworkers.

The purpose of this section is to identify general safety guidelines and personal protective measures that should be followed when handling potentially hazardous evidentiary materials or when exposed to hazardous environmental conditions. These recommendations are not all inclusive and should serve only as a guide and/or supplement for personal training and growth in safety awareness.

The basic safety guidelines for crime scene investigation and evidence collection are intended to serve only as a starting point for good safety practices. Personnel involved in crime scene investigations and evidence collection and handling should consult pertinent local, state, and federal laws concerning specific safety requirements and standards.

Routes of Exposure ¹

Inhalation

Inhalation is the most likely route of entry for chemicals as well as some infectious agents (e.g., tuberculosis). Chemical or biological contaminants present in inhaled air can easily enter the lungs and bloodstream where they can circulate throughout the system causing damage to target organs, such as the liver and kidney. Inhaled substances can be in the form of dusts, mists (aerosols), smoke, vapors, gases, or fumes. Proper work practices, engineering controls (e.g., ventilation) and, when necessary, the use of respirators minimize inhalation of air contaminants.

Ingestion

Ingestion is a less common route of exposure for both chemical and biological contaminants. Ingestion of a corrosive material can cause damage to the mouth, throat, and digestive tract. When swallowed, toxic chemicals may be absorbed by the body through the stomach and intestines. To prevent entry of toxic chemicals or biological hazards into the mouth, always wash your hands before eating, smoking, or applying cosmetics. Also, avoid bringing food, drink, and cigarettes into areas where contamination can occur.

Skin, Eye, and Mucous Membrane Contact

Contact of chemicals or infectious materials with the skin, eyes, or mucous membranes is a frequent route of entry. Chemical contact with those surfaces could result in local damage and subsequent absorption into the bloodstream, thereby causing other effects throughout the body. The effect of eye contact with a chemical can range from irritation to permanent blindness. Chemical exposure can be avoided by use of appropriate protective equipment such as gloves, safety glasses, goggles, and/or face shields.

Injection

Injection of foreign materials (chemical or biological) can cause a serious health hazard because the material can be delivered directly to the bloodstream or become embedded in the tissue. Exposure to toxic chemicals, human blood or other potentially infectious materials can inadvertently occur through mechanical injury from contaminated glass, metal, needles/syringes, or other objects. Therefore, extreme caution should be exercised when handling these or similar objects.

Crime Scene/Mass Disaster 2, 3

General Precautions

No one should enter the crime scene/mass disaster without the proper safety and personal protective equipment. (See Personal Protective Equipment, page 11.)

Individuals should not be permitted to eat, drink, smoke, or apply makeup at the crime scene/mass disaster.

The crime scene/mass disaster may be a source of contamination from a variety of sources including human blood and body fluids (both liquid and dried), human tissues and other remains.

Treat all human body fluids as potentially infectious and use Universal Precautions under Bloodborne Pathogen Safety, page 7.

In addition to the biological hazards, consideration must be given to the variety of chemical, environmental, and/or mechanical hazards that may be present at the crime scene/mass disaster.

Always be on the alert for sharp objects such as hypodermic needles, knives, razors, broken glass, nails, and exposed or cut metals.

Broken glass which may be contaminated should never be picked up directly with the hands. It should be collected using mechanical means, such as a brush and dust pan, tongs, or forceps.

Ensure that the crime scene/mass disaster is properly ventilated.

Mirrors and flashlights should be used when looking in confined spaces such as under car seats, beds, etc., prior to reaching into those areas with the hands.

Use a wooden paint stirrer, or other similar item, to search narrow and confined spaces, such as those found between car seats and chairs, before the hands are used.

Never recap hypodermic needles or place covers, such as pencil erasers, on the end of the needles.

Place all syringes, needles, and other sharp objects in puncture-resistant containers.

Refer to Bloodborne Pathogen-Chemical Safety, page 9, for specific safety procedures.

Access Control

Provide a means of controlled entry and exit for personnel and equipment entering or leaving the crime scene/mass disaster.

Provide a system for centralized decontamination of personnel and equipment and the collection of infectious waste (gloves, coveralls, etc.) to prevent transfer of potentially infectious material to noncontaminated areas such as the worker's office, car, or residence.

Procedures should be established for the proper disposal of all contaminated waste.

Violent Crimes

Violent crimes pose a greater potential for contact with infectious material.

All human blood, body fluids, and tissues, from both living and deceased individuals, must be handled as being potentially infectious for hepatitis and HIV (human immunodeficiency virus).

Avoid direct contact with all human blood, body fluids, and tissues. Personal protective equipment must be readily available and used. (See Universal Precautions under Bloodborne Pathogen Safety, page 7.)

Surgical caps, fluid-resistant protective clothing, face masks/shields, eye protection, shoe covers and boots should be worn in instances when gross contamination can be reasonably anticipated (e.g., autopsies, crime scenes, mass disasters).

Bombings

If a bombing incident occurs, investigative personnel should ensure that the following precautions are taken before entering the scene:

- Ensure that all utilities (electric, gas, and water) are turned off. Contact local utilities or power company for assistance.
- A bomb technician should first check the damaged area for unexploded bomb(s).
- The structure should then be checked by engineers for hazardous structural conditions.
- Do not touch or move any suspected explosive device at the crime scene until it has been rendered safe by a public safety bomb squad or military Explosive Ordnance Disposal Unit.

- Initial entry personnel should carry at least one radiation extremity monitoring alarming dosimeter/ratemeter in order to identify any potential radiation hazard.

- Use proper personal protective equipment such as hard hats, safety goggles, gloves, foul weather clothing, waterproof/puncture-resistant coveralls, steel-toe/steel-shank workboot, respirator, reflective tape for clothing, and any other protective item. (See Personal Protective Equipment, page 11.)

All bombing or explosive-related evidence which consists of substances of unknown composition, such as powders or liquids, must be assumed to be extremely sensitive and capable of initiation or detonation.

Unknown substances in these matters should be examined by a bomb technician or a forensic chemist before collection.

Prior to packaging for shipment, call the FBI Laboratory, Explosives Unit at (202) 324-2696 to ascertain the quantity needed for analysis, the packaging method to be used, and the proper shipping method. Also, call for questions regarding handling of these types of substances.

All unknown substances should be labeled:

Use caution when handling. Substance is possibly flammable or explosive.

All evidence collected at the crime scene which has been examined by a forensic specialist (bomb technician or chemist) and found to be safe and nonhazardous should be clearly labeled as such. The label should be clearly visible and include the name, agency, and phone number of the forensic expert who examined the material and made the determination that it was safe.

Clandestine Drug Laboratories

Clandestine drug laboratories may present extremely dangerous situations to untrained personnel. These laboratories often contain extremely dangerous chemicals, which may be intentionally mislabeled, as well as "booby trapped," to prevent entry. They should only be searched, cleared, and decontaminated by the Drug Enforcement Administration (DEA) personnel who are trained and certified for this type of work.

When dealing with clandestine drug laboratories, evacuate the scene, secure the area, and contact the nearest office of the DEA.

Removal of Hazardous Materials from the Crime Scene/Mass Disaster

All hazardous materials should be properly labeled, stating the type of hazard and any special handling procedures before being removed from the crime scene/mass disaster.

All hazardous material labels should be clearly visible and include the agency, name, and phone number of the forensic expert who examined the material.

Title 49 of the Code of Federal Regulations lists specific requirements that must be observed in preparing hazardous materials for shipment by air, highway, rail, water, or any combination thereof.

Title 49 of the Code of Federal Regulations, part 172.101, provides a Hazardous Materials Table which identifies those items considered hazardous for the purpose of transportation, special provisions, hazardous materials communications, emergency response information, and training requirements.

Exposure to Critical (Traumatic) Incidents ⁴

Shootings, drownings, accidents, sexual assault, and child abuse are only a few examples of critical (traumatic) incidents that law enforcement personnel are exposed to which may produce significant emotional responses. These responses may include any of the following:

- Alcohol/substance abuse
- Anger
- Anxiety
- Crying/depression
- Fatigue
- Flashbacks and intrusive thoughts
- Guilt
- Heightened sense of danger
- Isolation/withdrawal
- Marital problems
- Nightmares
- Numbness
- Perceptions of going insane
- Startle reactions (e.g., difficulty sleeping, headaches, muscle aches, stomachaches, high blood pressure, etc.)
- Trouble remembering/concentrating

For additional information or assistance concerning critical (traumatic) incidents, contact:

The International Critical Incident Stress Foundation, Baltimore, Maryland, (410) 730-4311. If emergency assistance is needed, contact the 24-hour: **Critical Incident Stress Debriefing (CISD) Hotline, (410) 313-2473.**

Safety

Bloodborne Pathogen Safety ⁵

On December 6, 1991, the Occupational Safety and Health Administration (OSHA) issued the regulation called "Occupational

Exposure to Bloodborne Pathogens (BBP)," found in Title 29, Section 1910.1030 of the Code of Federal Regulations. The standard covers those occupations having a high potential for exposure to bloodborne pathogens, including law enforcement, emergency response, and crime laboratory personnel.

Individuals covered by this standard should observe **Universal Precautions** to prevent contact with human blood, body fluids, tissues and other potentially infectious materials.

Universal Precautions require that employees treat all human blood, body fluids, or other potentially infectious materials to be infectious for hepatitis B virus (HBV), human immunodeficiency virus (HIV), and other bloodborne pathogens. Appropriate protective measures to be taken to avoid direct contact with these materials include:

- Use barrier protection at all times.
- Prohibit eating, drinking, smoking, or applying makeup at the crime scene/mass disaster.
- Use gloves when there may be hand contact with blood or other potentially infectious materials. Gloves should always be worn as if there are cuts, scratches, or other breaks in the skin. In some instances where there is heavily contaminated material, the use of double gloves is advisable for additional protection.
- Change gloves when contaminated or as soon as feasible if torn, punctured, or when their ability to function as a barrier is compromised.
- Always wash hands after removal of gloves or other personal protective equipment (PPE). The removal of gloves and other PPE should be performed in a manner

which will not result in the contamination of unprotected skin or clothing.

- Wear safety goggles, protective face masks or shields, or glasses with side shields to protect from splashes, sprays, spatters, or droplets of blood or other potentially infectious materials. These same precautions must be taken when collecting dried stains for laboratory analyses.
- Use disposable items, such as gloves, coveralls, shoe covers, etc., when potentially infectious materials are present.
- Place contaminated sharps (e.g., broken glass, needles, knives, etc.) in appropriate leakproof, closable, puncture-resistant containers when these sharps are to be discarded, transported, or shipped. If transported or shipped, containers should be appropriately labeled.
- Do not bend, recap, remove, or otherwise handle contaminated needles or other sharps.
- Use a protective device, such as a CPR mask, when performing mouth-to-mouth resuscitation.
- Decontaminate all equipment after use with a solution of household bleach (diluted 1:10), 70% isopropyl alcohol, or other appropriate disinfectants.
- After all evidence has been collected and the crime scene has been released, the owner or occupants of the affected property should be made aware of the potential risks from bloodborne pathogens.
- Evidence containing blood or other body fluids should be completely dried before it is packaged and shipped to the laboratory for analysis. Appropriate biohazard warning labels must be affixed to the evidence container indicating that a potentially infectious material may be present.

- To avoid direct contact and exposure to potentially infectious evidentiary materials in the courtroom, all evidence contaminated with human blood or other potentially infectious materials should be placed in a sealed, transparent package and labeled with the appropriate biohazard warning label.

Additional Precautions

In addition to Universal Precautions, there are certain requirements in the OSHA BBP standard that pertain to collection, handling, storage, transport, and shipping of blood and other potentially infectious material.

Evidence specimens contaminated with wet blood or other potentially infectious materials must be placed in a closable, leakproof container (i.e., heavy-duty plastic bag) when transported from the crime scene to the drying location. After drying, the evidence must be placed in a suitable and properly labeled container before being transported to the crime laboratory. (Note: Plastic bags used to transport evidence contaminated with wet blood or other fluids should be retained as evidence.)

OSHA's BBP standard 29 CFR 1910.1030 (g)(1)(i), requires that evidence specimens, such as liquid blood (vacutainer tubes) or other potentially infectious materials, must be placed in a closable, leakproof container and labeled (see above) or color-coded prior to being stored or transported.



Engineering and work practice controls are used to eliminate or minimize employee exposure to hazardous materials.

Engineering controls (e.g., puncture-resistant containers for contaminated sharps, paint stirrers, and adjustable mirrors for locating evidence in confined/hidden spaces) isolate or remove the hazard, whether bloodborne or chemical, from the workplace. Workplace controls (e.g., handwashing facilities, wearing personal protective equipment) reduce the likelihood of exposure by altering the manner in which a task is performed.

For additional information on proper protection against blood and other potentially infectious materials, refer to "Personal Protective Equipment," page 11.

Decontamination of Nondisposable Clothing

These recommendations apply only to non-disposable clothing and not to clothing that is part of the personal protective equipment according to OSHA 29 CFR 1910.1030.

- Protect hands with disposable gloves.
- Remove contaminated garment carefully; protect skin and mucosal surfaces during removal, e.g., cover face and eyes with mask and goggles or face shield when removing garment over head.
- Fill a sink, bucket, or deep tray with cold water and soak contaminated part of garment to remove blood or other material. Using gloves, squeeze out water from garment; dispose of water into sewer, toilet, or dirty sink; rinse sink and container with plenty of water; disinfect container if needed.
- Store garment in plastic bag prior to being laundered.

- OR -

- Place garment into tray and cover contaminated area with one of the following disinfectants:

- 1:20 dilution of fresh chlorine bleach for fabrics that tolerate bleaching such as white coats or uniforms;
- 70% alcohol (ethanol or isopropanol) for delicate fabrics.

• Let soak for 10 minutes, remove, rinse with water, and dry. The disinfected garment can be laundered or dry cleaned.

Chemical Safety 1, 6

Depending on the type of material encountered, a variety of health or safety hazards may exist. Some of those hazards are identified by the following categories:

Flammable or combustible materials (e.g., gasoline, acetone, ether) ignite easily when exposed to both air and an ignition source such as a spark or flame.

Explosive materials (e.g., dynamite, C-4, TNT, etc.) are chemically unstable. Instability determines the sensitivity (i.e., the amount of energy required to initiate a reaction). Explosives containing nitroglycerine require a minimal amount of shock to be initiated. Heat, friction, and fire are also means for initiation.

Pyrophoric material is any liquid or solid igniting spontaneously in air at or below 130° F (54° C). Examples include phosphorus, sodium, and barium.

Oxidizers are a class of chemical compounds that can react violently with flammable and combustible materials. Some common types of oxidizers include chlorates, nitrates, hydrogen peroxide, perchloric acid, and sulfuric acid. Avoid storage with incompatible materials that could react with the oxidizer or catalyze its decomposition.

Corrosive materials are those substances which can cause injury to body tissue or be corrosive to metal. Corrosive injury may be to

a minor degree (irritation) or actual physical destruction of body tissues. Corrosive chemicals act on body tissues through direct contact with the skin or eyes, inhalation, or ingestion.

The key to working safely with chemicals is knowledge of their hazardous properties, proper training in handling and disposal techniques, and emergency preparedness.

For proper protection against Chemical Hazards, see "Personal Protective Equipment," page 11.

Latent Fingerprint Safety 2, 3

Refer to Bloodborne Pathogen Safety, page 6, when dealing with any human tissue or body fluid from a living or deceased individual.

When latent print evidence is contaminated by human biological material, appropriate personal protective equipment and engineering controls **must** be used during the examination.

Light Source Safety 2, 7, 8

The use of ultraviolet (UV) lights, lasers, and other alternative light sources are increasing in use not only in the latent fingerprint field, but in forensic science in general. While these tools are of great value to the forensic scientist, they also create some potentially hazardous conditions, especially when the user is untrained or unaware of the hazards associated with their use. The operator of any light source must be properly trained in the use and safety of these instruments. Regardless of the light source being used, it is **absolutely essential that appropriate eyewear be worn by the user and by all personnel in the vicinity of the device.**

When using UV light sources, it is essential that an individual's eyes be protected from direct exposure and that prolonged exposure to the skin be avoided.

Because some lasers create an apparent

point source of light which may not be visible to the viewer, there exists an enormous radiant energy which has the potential to cause irreversible damage to the retinal tissues of the eye from both direct and/or reflected beams.

Personal protection for the eyes requires goggles which have sufficient protective material and which are fitted so that stray light cannot enter from any angle. All laser protective eyewear should be clearly labeled with the optical density and wavelength for which protection is afforded.

Avoid both direct and indirect (reflected from a polished surface) eye and skin contact with a collimated laser beam.

Eyewear, worn while conducting examinations using high-powered lasers, should be approved by the American National Standards Institute (ANSI), and have an optical density of five or greater at the maximum operating wavelength.

Adequate ventilation should be provided with all lasers.

Lasers can present a shock hazard both indoors and outdoors in a wet environment.

Keep the exit port of the light source at a sufficient distance from surfaces to prevent overheating and combustion.

Firearms Safety

Weapons should never be shipped or stored in a loaded condition.

Remove all ammunition from firearms and follow DOT regulations for transportation.

For submission of live ammunition, bullets, and/or guns, see page 58.

Confined Space Safety ⁹

A confined space is an enclosed space large enough for an individual to bodily enter and perform assigned work. It has limited or constricted means of entry or exit and is not designed for continuous occupancy.

Entry into confined spaces may expose the individual to a variety of hazards, including toxic gases, explosive atmospheres, oxygen deficiency, and electrical hazards.

Conditions in a confined space must be considered immediately dangerous to life and health unless shown otherwise.

Some safety tips for working in confined spaces include:

- Never enter a confined space before all hazards (atmospheric, engulfment, and mechanical) have been identified and procedures have been developed to deal with them.
- Always isolate the confined space from all unwanted energy sources or hazardous substances.
- Always maintain proper mechanical ventilation in a confined space and make sure ventilation equipment does not interfere with entry, exit, and rescue procedures.
- Never introduce hazards such as welding, cleaning solvents, etc., in a confined space without first making provisions for these hazards.
- Always monitor for atmospheric hazards (oxygen, combustibles, toxins) prior to and during entry.
- Always provide barriers, as necessary, to warn unauthorized personnel and to keep entrants safe from external hazards.

- Always provide constant communications between entrants and outside attendants, and remember to have backup communications if using two-way radios.

- Always wear appropriate personal protective equipment; be familiar with the use and limitations of that equipment; and be sure it is properly maintained.

- Never attempt rescue in a confined space unless you are part of a designated rescue team and have the proper knowledge, skills, and equipment to effect a safe rescue.

- Use of safety belts and harnesses is mandatory.

For additional information, refer to the OSHA standard for permit-required confined spaces, 29 CFR 1910.146.

Personal Protective Equipment

Hand Protection ^{10, 11}

Hand protection should be selected on the basis of the material being handled and the particular hazard (biological or chemical) involved. For chemical resistance, select the glove material that offers the best level of protection for the chemicals handled. The following are some glove material types and their functions:

Nitrile (NBR) provides protection from acids, alkaline solutions, hydraulic fluid, photo solutions, fuels, lubricants, aromatic, petroleum, and chlorinated solvents. It also offers excellent resistance to punctures, cuts, and snags.

Neoprene offers resistance to oil, grease, acids, solvents, alkalies, bases, and most refrigerants.

Polyvinyl chloride (PVC) is chemically resistant to alkalies, oils, limited concentra-

tions of nitric and chromic acids. This material can be worn by most workers who are allergic to natural rubber.

Natural Rubber (Latex) resists mild acids, caustics, detergents, germicides and ketonic solutions, but it will swell and degrade if exposed to gasoline and kerosene. Because gloves made from natural rubber (latex) are adversely affected by exposure to high temperatures and direct sunlight, they should not be stored for an extended period of time in the passenger area or trunk of a car.

Have readily accessible hypoallergenic gloves, glove liners, powderless gloves, and other similar alternatives for those allergic to the normally provided gloves.

Check the gloves to be used for holes, punctures, and tears and remove rings or other sharp objects which may cause punctures.

Wear heavy (8-10 mil thick) latex gloves or a double layer of gloves when working with items heavily contaminated with blood or other human biological material.

Remove gloves carefully by grasping the cuffs and pulling them off inside out, starting at the wrist and working toward the fingers.

Discard disposable gloves in designated containers. Do not reuse.

Eye Protection ^{1, 12}

Eye protection is an important consideration when working at a crime scene or when handling potentially hazardous materials. Appropriate eye protection (face shields, goggles and safety glasses) should be worn when handling any of the following materials:

biohazards
caustics, corrosives, or irritants

explosives
flammable materials
lasers
radioactive materials
UV light

Types of Eye Protection

Refer to **American National Standard Practice for Occupational and Educational Eye and Face Protection, American National Standards Institute, ANSI Z87.1-1989 (or latest revision)** for additional information.

Safety Glasses

At the crime scene, you are likely to encounter both biological and chemical hazards. There always exists the potential for splashing biological fluids or chemicals. In addition, flying objects may enter the eyes if not properly protected. Safety glasses should be worn at all times in the presence of these hazards. In most instances, safety glasses with side shields are adequate. Where there is danger of splashing of biological fluids, chemicals, or flying particles, goggles and/or full face shields will give more protection.

Contact Lenses

Contact lenses are not to be used as eye protection. In the event of a chemical splash into the eye, it is often extremely difficult to remove the contact lens to irrigate the eye. Gases and vapors can be concentrated under such lenses and cause injury or permanent eye damage.

Prescription Safety Glasses

Crime scene personnel whose vision requires the use of corrective lenses should wear safety eye protection of one of the following types:

- Prescription safety glasses with

protective lenses.

- Safety eyewear that can be worn over prescription glasses without disturbing the adjustment of the glasses.

Safety Goggles

Goggles are not intended for general use. They are intended for wear when there is danger of splashing chemicals or flying particles.

Face Masks/Shields

Full-face masks/shields that protect the face and throat should always be worn when maximum protection from flying particles and harmful liquids (biological or chemical) is needed.

Foot Protection ¹⁰

Shoes that completely cover and protect the foot are recommended. Shoes that expose the foot in any way should not be worn. In addition, fabric shoes, such as tennis shoes, should not be worn as they may readily absorb liquid. Certain hazardous situations may require footwear that has conductive soles, insulated soles, steel toe and shank, and is chemical resistant.

Respiratory Protection ^{1, 10, 13}

Certain crime scenes, such as bombings and clandestine laboratories, may produce noxious fumes and other airborne contaminants which require respiratory protection.

Safety supply companies carry many types of respirators ranging from a disposable dust mask to a self-contained breathing apparatus. Selection should be made according to the guidelines in the **American National Standard Practices for Respiratory Protection Z88.2-1992**, after consultation with health and safety professionals.

The critical elements for the successful use of a respirator include training, motivation, medical evaluation, fit testing, and a respirator maintenance program. Without a complete respiratory protection program, personnel will not receive the degree of protection anticipated from a respirator, even if it is a correct choice for the situation. As a minimum, compliance with Title 29 CFR 1910.134 is **mandatory** whenever respirators are used by personnel, whether on a required or voluntary basis.

Head Protection ¹⁴

Elimination or control of hazards leading to an accident should be given first consideration, but many accidents causing head injuries are difficult to anticipate and control. Where these conditions exist, appropriate head protection must be provided to eliminate injury.

Head protection, in the form of protective hats, must resist penetration and absorb the impact. In certain situations, such as bombings which can cause structural damage to a scene, additional head protection may be necessary. Heavy-duty fireman-type hats provide added protection to the ears and posterior neck. Protective helmets also protect against electrical shock.

The standard recognized by OSHA for protective hats is contained in **ANSI Requirements for Industrial Head Protection, Z89.1-1986**. This standard should be consulted for further details.

Endnotes

1 Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Research Council, Committee on Hazardous Substances in the Laboratory, National Academy Press, Washington, D.C. 1981.

2 Bigbee, P.D., Laboratory Safety, 2nd. Edition, Federal Bureau of Investigation, June 1, 1989.

3 "Report of Special Committee for Safety," International Association for Identification, 2516 Otis Drive, Alameda, CA.

4 James M. Horn, M.F.S. and Roger M. Solomon, "Peer Support: A Key Element for Coping with Trauma," Police Stress, Winter 1989, Vol. 9, No. 1, pp. 25-27.

5 U.S. Department of Labor, Occupational Safety and Health Administration, Title 29 CFR Section 1910.1030, "Occupational Exposure to Blood-borne Pathogens; Final Rule." December 6, 1991.

6 Mark J. Upfal, MD, MPH, Pocket Guide to First Aid for Chemical Injuries, Edited by John R. Stuart, Genium Publishing Corporation, Schenectady, NY. 1991.

7 Betty Carrell, BS, RN, and R. James Rockwell, Jr., MSc, Lasers: Identification and Recommendations for the Occupational Health Nurse, AAOHN Update Series 3/14.

8 American National Standard for the Safe Use of Lasers, (ANSI Z136.1-1986), American National Standards Institute, Inc., New York, NY.

9 John V. Conforti, Confined Space Pocket Guide, Edited by Christine Gorman, Genium Publishing Corporation. 1992.

10 Laboratory Survival Manual, Environmental Health and Safety Office, University of Virginia, Charlottesville, VA.

11 "Choose the Proper Gloves for Chemical Handling," Best's Safety Directory 1990, 30th Edition, Pioneer Industrial Products, Willard, OH.

12 American National Standard Practice for Occupational and Educational Eye and Face Protection, American National Standards Institute, ANSI Z87.1-1979, New York, NY.

13 Hazardous Waste Handling Pocket Guide, Editor Christine Gorman, Genium Publishing Corporation. Schenectady, NY. 1991.

14 U.S. Department of Labor, Occupational Safety and Health Administration, "Personal Protective Equipment," OSHA 3077. Revised 1992.



Evidence cannot be presumed to be *evident*...it must be proven...
and, it must be documented and demonstrated...

FBI Document Section

The Crime Scene

The physical evidence recovered during investigations of crime scenes is one of the critical areas in contemporary law enforcement. Often, the facts and tangible items of evidence derived from these investigations make the difference between success and failure when a case is brought to trial. With the evolution of the scientific aspects of forensic science, more attention must be awarded at crime scenes to recovering and maintaining the integrity of evidence which will be eventually examined by specialists in the crime laboratory.

One important consideration, bearing on the modern view of forensic science is that this field is sometimes associated only with work accomplished in the crime laboratory. This consideration, however, is in actuality a very limited perspective on the overall area of forensic science. It is obvious that the ability of the laboratory to provide scientific interpretations is dependent to a great extent on the recognition, recovery and documentation of evidence at the crime scene. In essence, then, the field investigator or crime scene technician is as much a part of forensic science as the highly skilled laboratory examiner. If the evidence from a scene is not properly handled, the work of the crime laboratory can be hindered to a great extent.

Therefore, it is suggested the discipline of forensic science be regarded as a multifaceted one. Each level of evidence involvement must be planned, organized, and performed with a central issue in mind—effective use of the physical evidence to its greatest potential.

It should be ensured that the crime scene searches are conducted in a systematic and methodical fashion. Numerous suggestions are presented in terms of practical aspects of day-to-day search operations.

Due to the myriad situations which can occur, it would be virtually impossible to cover all conceivable possibilities. Nonetheless, the material contained herein brings out significant concerns common to almost all agencies. Additionally, these points should serve as catalysts for the reader to generate other important items based on specific agency needs.

If more information on this topic is needed, contact the Forensic Science Training Unit, Quantico, Virginia, telephone (703) 640-1239.

Practical Suggestions Regarding Crime Scene Administration and Management

Preparation

Accumulate packaging and collection of materials necessary for typical search circumstances.

Prepare the preliminary format for the paperwork needed to document the conducting of the search.

Ensure that all specialists are aware of the overall forms of evidence usually encountered as well as the proper handling of these materials.

Evaluate the current legal ramifications of crime scene searches (e.g., obtaining of search warrants).

Discuss the search with involved personnel before arrival at scene, if possible.

Identify, when feasible, a person-in-charge prior to arrival at scene.

Make preliminary personnel assignments before arrival at scene, if practicable.

Consider the safety and comfort of search personnel. When encountering a potentially dangerous

scene or inclement weather, be prepared with:

- clothing
- communication
- lighting assistance
- shelter
- transportation
- food
- medical assistance
- scene security
- equipment

Assess the personnel assignments normally required to successfully process a crime scene.

The following information is provided as an example of the personnel responsibilities. (Depending on circumstances and personnel availability, it may not be feasible to have one person assigned to each duty. It is relatively common for one individual to accomplish two or more responsibilities.)

Person-In-Charge

- administrative log
- narrative description
- preliminary survey
- scene security
- final decision making

Photographer

- photographs
- photographic log

Sketch Preparer

- sketch
- documentation of items on sketch

Evidence Recorder

- evidence log
- evidence custodian

In instances of prolonged search efforts, consider the use of shifts using two or more teams. Transfer paperwork and responsibility in a preplanned manner from one team to the next.

Organize communication with services of any ancillary nature (e.g., medical examiner, prosecutive attorney) in order that questions which surface during crime scene search may be resolved. Take steps to organize a command post headquarters for communication, decision making, etc., in major/complicated crime scene investigations.

The possibility of coordinating multijurisdiction scene investigations should be explored. It is advantageous to have working agreements that are mutually acceptable to potentially involved agencies. These agreements should be made before confusion occurs in an actual multijurisdiction case, rather than as a later crisis response.

Basic Stages in a Crime Scene Search

Approach Scene

Be alert for discarded evidence.

Make pertinent notes.

Establish frame of mind to take control of scene regardless of circumstances observed on arrival.

Consider personal safety.

Secure and Protect Scene

Take control on arrival.

Determine extent to which scene has thus far been protected.

Check for adequate scene security even if advised that it has been protected prior to arrival.

Obtain information from logical personnel who have entered scene and have knowledge relative to its original conditions.

Identify one individual who is designated as the person-in-charge for final decision making and problem resolution.

Take notes—do not rely on memory.

Keep out unautho-

rized personnel—begin recording who enters and leaves.

Initiate Preliminary Survey

The survey is an organizational stage to plan for the entire search.

Cautiously, walk through the scene.

Maintain definite administrative and emotional control (usually the person-in-charge).

Select appropriate narrative description technique.

Acquire preliminary photographs.

Delineate extent of the search area—usually expand initial perimeter.

Organize methods and procedures needed—recognize special problem areas.

Determine manpower and equipment needs—make specific assignments.

Identify and protect transient physical evidence, e.g., evidence that can be lost such as hairs, fibers, dust, etc.

Develop a general theory of the crime.

Make extensive notes to document the scene's physical and environmental conditions, assignments, movement of personnel, etc.

Evaluate Physical Evidence Possibilities

This evaluation begins upon arrival at scene and becomes detailed in the preliminary survey stage.

Based on the preliminary survey, establish evidence types most likely to be encountered.

Ensure collection and packaging equipment is sufficient for task at hand—a given scene may require special techniques not normally used.

Focus first on evidence that could be lost (e.g., detached from garment) and leave the least transient forms of evidence to be last.

Ensure all personnel consider the great variety of possible evidence, not only evidence within the scope of their respective specialties.

Focus first on the easily accessible areas in open view and progress eventually to possible out-of-view locations—look for purposely hidden items.

Consider whether the evidence appears to have been moved inadvertently.

Evaluate whether or not the scene and evidence appear intentionally contrived.

Prepare Narrative Description

The narrative is a running, written description of the condition of the crime scene in general terms.

Represent the scene in a general to specific reference scheme.

Use photographs to supplement narrative description.

Use a systematic approach in recording the narrative—no item is too insignificant to record if it catches one's attention.

Do not permit the narrative effort to degenerate into a sporadic and unorganized attempt to recover physical evidence—it is recommended that evidence not be collected at this point, under most circumstances.

Methods of narrative include: written, audio, and video (sight/sound or sight only).

Depict Scene Photographically

Begin photography as soon as possible—plan before photographing.

Document the photographic effort with a photographic log.

Ensure that a progression of overall, medium, and close-up views of the scene is established.

Use a recognized scale device for size determination when applicable.

When a scale device is used, first take a photograph without the inclusion of this device.

Photograph the evidence in place before collecting and packaging it.

Be observant of and photograph areas adjacent to the crime scene—points of entry, exits, windows, attics, etc.

Consider the feasibility of aerial photography.

Photograph items, places, etc., to corroborate the statements of witnesses, victims, and suspects.

Take photographs from eye level, when feasible, to represent the scene as would be observed by normal view.

Points to Consider

Use two-dimensional photographs supplemented by diagrams/sketches.

Do not hesitate to photograph something which has no apparent signifi-

cance. Film is relatively cheap compared to the importance of providing evidence to the investigator.

Prepare Diagram/Sketch of Scene

The diagram establishes a permanent record of items, conditions and distance/size relationships—diagrams supplement photographs.

Draw a rough sketch at the scene—normally not drawn to scale.

Typical material on the rough sketch:

- . specific location
- . date
- . time
- . case identifier
- . preparer/assistants
- . weather conditions
- . lighting conditions
- . scale or scale disclaimer
- . compass orientation
- . evidence
- . measurements
- . key or legend

Number designations on the sketch may be coordinated with same number designations on the evidence log in many instances.

This sketch should contain sufficient measurements and details to be used as a model for a drawn-to-scale diagram, if neces-

sary.

Be sure to select the sketch technique before beginning the sketch—ensure that enough room is allowed to include all pertinent information and measurements.

General progression of sketches:

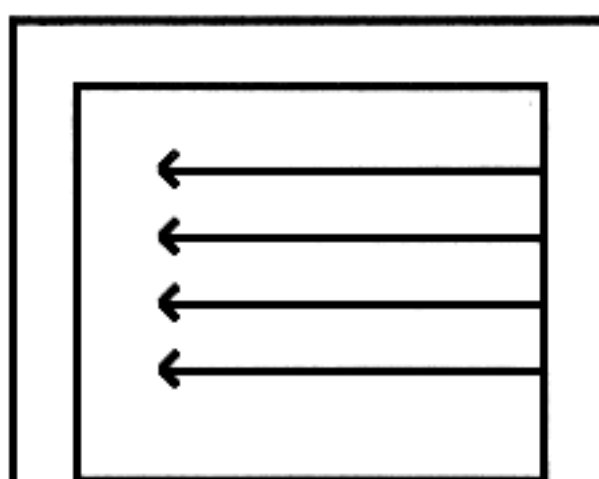
- lay out the basic perimeter.
- set forth fixed objects, furniture, etc.
- insert evidence as it is recovered.
- record appropriate measurements.
- set forth the key/legend, compass orientation, etc.

Conduct Detailed Search/Record and Collect Physical Evidence

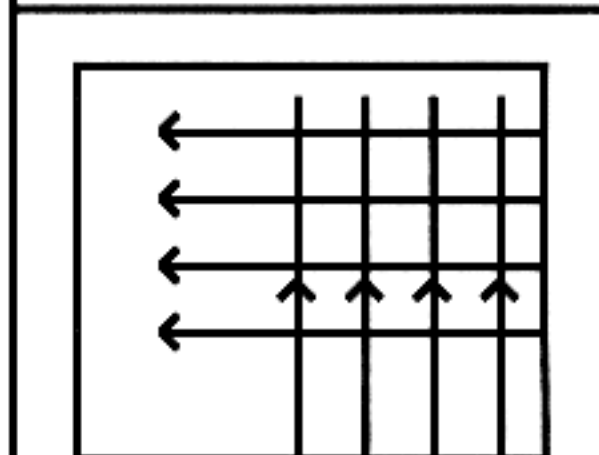
Accomplish the search based on a previous evaluation of evidence possibilities.

Conduct search from general to specific, regarding evidence items.

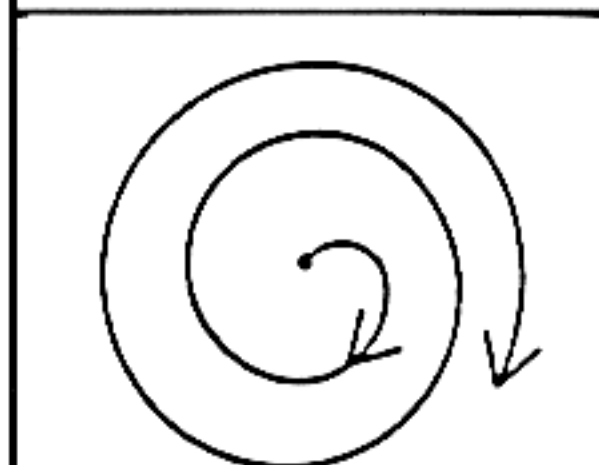
Use specialized search patterns when possible, (e.g., strip, grid, spiral, quadrant or zone).



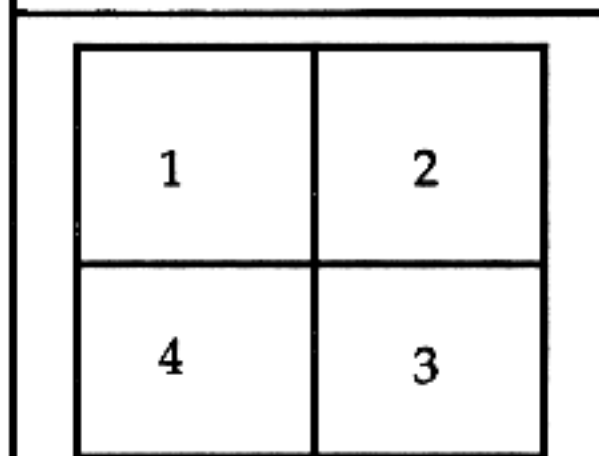
STRIP



GRID



SPIRAL



QUADRANT OR ZONE

Photograph all items before collection and enter notations in the photographic log (remember to use a scale device when necessary).

Mark evidence locations on the diagram/sketch.

Complete the evidence log with appropriate notations for each item of evidence.

Have at least two persons:

- see evidence in place before collection.
- observe it being recovered.
- mark evidence (mark item itself whenever feasible).
- place identifying marks on evidence containers.

If feasible, have one person as an evidence custodian—especially in relatively complicated crime scenes involving large amounts of evidence.

Do not excessively handle the evidence after recovery.

Seal all evidence containers at the crime scene.

Do not guess on packaging requirements—different types of evidence may necessitate different containers.

Do not forget entrance and exit areas at the scene for potential evidence.

Be sure to obtain appropriate known standards

(e.g., fiber samples from a known carpet).

Always make a complete evaluation of the crime scene. Do not rely on the results of Laboratory tests only.

Constantly check paperwork, packaging notations, and other pertinent recordings of information for possible errors which may cause confusion or problems at a later time.

Four Basic Premises to Consider

The best search options are often the most difficult and time consuming.

You cannot over-document the physical evidence.

There is only one chance to perform the job properly.

There are two basic search approaches, in this order:

1. A **cautious** search of visible areas, taking steps to avoid evidence loss or contamination.
2. After the cautious search, a vigorous search for hidden/concealed areas.

Conduct Final Survey

This survey is a critical review of all aspects of the search.

Discuss the search jointly with all personnel for completeness.

Double-check documentation to detect inadvertent errors.

Ensure that photographs are taken of scene showing the final condition after completion of the search.

Check to ensure all evidence is accounted for before departing the scene.

Ensure all equipment used in the search is gathered.

Make sure possible hiding places or difficult access areas have not been overlooked in a detailed search.

Critical issues:

Have you gone far enough in the search for evidence, documented all essential things, and made no assumptions which may prove to be incorrect in the future?

Release Crime Scene

Release the crime scene only after completion of the final survey.

At minimum, documentation should be made of:

- time/date of release.
- to whom released.
- by whom released.

Ensure that the evidence found at the crime scene is gathered according to legal requirements, is documented, and is appropriately marked for future reference.

Once the scene has been formally released, reentry may require a warrant.

Only the person-in-charge should have the authority to release the scene. Ensure that all personnel follow this rule.

Release the scene with the notion that there is only one chance to perform the job correctly and completely. Release then occurs once personnel are satisfied this is the situation.

Consider the need for experts (e.g., blood pattern analyst, medical examiner) to observe the scene before it is released.

FBI Criminal Justice Information Services

LAST NAME		FIRST NAME		MIDDLE NAME		SEX		HAIR COLOR		EYES		LEAVE BLANK	
Gangster		N.		Torious									
ALIAS		IDENTIFICATION		DATE OF BIRTH		PLACE OF BIRTH		RACE		HEIGHT		WEIGHT	
"Baby Face" Ford				47-756		U.S.A.		B		5' 6"		267	
DATE OF ARREST		ARRESTING AGENCY		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION	
2/4/92		Illinois State Police		12/4/92									
CHARGE		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION	
Fraud, Tax Evasion													
FINAL DISPOSITION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION		MAY HAVE OTHER IDENTIFICATION	
Life without parole													
FINGERPRINTS		FINGERPRINTS		FINGERPRINTS		FINGERPRINTS		FINGERPRINTS		FINGERPRINTS		FINGERPRINTS	
1. R. THUMB		2. R. INDEX		3. R. MIDDLE		4. R. RING		5. R. LITTLE		6. L. THUMB		7. L. INDEX	
8. L. MIDDLE		9. L. RING		10. L. LITTLE		11. LEFT FOUR FINGERS TAKEN INDIVIDUALLY		12. LEFT THUMB		13. LEFT INDEX		14. LEFT FOUR FINGERS TAKEN TOGETHER INDIVIDUALLY	

History

An Act of Congress established the FBI's Identification Division on July 1, 1924, to provide identification services. The fingerprint records of both the National Bureau of Criminal Identification and the Leavenworth Penitentiary, totalling 810,188, were consolidated to form the nucleus of the FBI fingerprint files.

In 1924, the FBI began processing fingerprint cards on a manual basis. The prints were inked impressions on a standard 8" x 8" fingerprint card, as shown in the picture above. Trained fingerprint examiners made identifications by comparing the prints submitted with those in the FBI's master file.

Current Operation

The FBI serves as the Nation's civil and criminal fingerprint repository and for the criminal justice information to federal, state, local, and international members of the criminal justice community. As of November 1992, over 200,500,000 criminal and civil prints, representing over 67,000,000 persons, are in file. During Fiscal Year 1992, the FBI processed more than 9.2 million fingerprint cards and received over 3.6 million pieces of correspondence from more than 67,000 users of this service. The FBI receives over 34,000 fingerprint cards each day.

During 1989-1990, the FBI and other criminal justice representatives coordinated an effort to revitalize the FBI's criminal justice information services. In February 1992, the FBI established Criminal Justice Information Services (CJIS) Division to serve as the focal point and central repository for criminal justice information services in the FBI. As a result, the current fingerprint operations of the Identification Division were merged into the CJIS Division on May 1, 1993.

Standard Forms for Submitting Identification Data:

• Advantages:

1. Saves time of investigative personnel as forms and information are uniform.
2. Saves time of contributor in writing letters or requests.
3. Ensures inclusion of essential data.

• Forms available:

FD-249 - Required form for preaddressed criminal fingerprint cards.

FD-258 - Applicant fingerprint cards.

FD-353 - Personal identification fingerprint cards.

I-12 — Form used to place a flash notice in an individual's record.

I-178 — Requisition form to order supply of above-mentioned forms.

R-84 — Disposition sheets to subsequently furnish final disposition to an arrest for which a fingerprint card was previously submitted.

—Preaddressed postage and fees prepaid envelopes for criminal justice use.

Search of Fingerprint Cards

Submit the charge in narrative form rather than by state code citations.

• In order to achieve uniformity in arrest data stored at the national level and to improve efficiency, the following policies and procedures were approved by the Attorney General of the United States:

1. Fingerprints should not be submitted to the FBI in connection with nonserious offenses unless there is a question of identity or a check of FBI files is considered necessary for current investigative purposes.

2. Fingerprint cards submitted on non-serious offenses will be searched through FBI files and returned to the contributor with results of the search.

3. Every identification record furnished will bear an FBI number.

4. Criminal fingerprint cards submitted to the FBI for which there will not be a court adjudication (final disposition) will be searched and returned to the contributor along with the results of the search.

5. Nonfederal applicant fingerprint cards are searched through FBI files, and records are disseminated only after the following requirements have been met:

- a. A state statute must provide for fingerprinting as a requisite for the type of applicant position involved or for the type of license to be issued.

- b. All applicant and licensee fingerprints must first be checked through the appropriate state identification bureau or, if no such bureau exists, through a central agency designated for such purposes within the state.

- c. The state bureau or agency handling the fingerprint card should forward only those prints on which no disqualifying record or substantive information is found locally.

• Value of records.

1. Provides identification and record of prior offenders.

2. Identifies fugitives from justice.

3. Uncovers criminal information regard-

ing persons seeking employment in law enforcement, government, and banking and securities institutions.

4. Uncovers "habitual criminal law" offenders (three or more prior felony convictions).
5. Provides prosecuting attorneys, judges, and parole officers with background of defendants.
6. Identifies dead (homicides, accidental deaths, or deaths from natural causes).
 - a. Identification of victim essential to investigation of crime.
 - b. Generally essential to prosecution of crime.
 - c. Family can be notified.
 - d. Military burial rights established.
7. Identifies victims of amnesia or accidents.
8. Identifies missing persons.

• **Footprint File**

1. If arrested person has no fingers, footprints may be taken for records purposes.
2. Area behind "great toes" is used for classification.
3. About 400 sets of footprints are contained in FBI files.

Name Checks to Locate Identification Records (checks include aliases and nicknames)

- Provides investigative leads and background of suspects where fingerprints are not available for search.

- Locates fingerprint records or possible records of fugitives.

- Adequate data must be furnished on which to make a search:

1. Name
2. FBI number, or
3. Law enforcement agency arrest number, State Identification Division (SID) number, or
4. Armed Forces service number, or
5. Social Security number.
6. Any and all of the above should be furnished when known in order to expedite the service and assist in making it as accurate as possible.

Fugitive Program

- Wanted notices are placed on fingerprint records for law enforcement agencies.

1. The law enforcement agency is notified immediately if a fugitive is arrested.
2. Over 152,752 (as of 11/92) fugitive notices are processed, with an average additional of 2,000 per month.
3. Approximately 2,000 fugitives are identified per month.

- Records and personal descriptions of fugitives are furnished to the law enforcement agency.

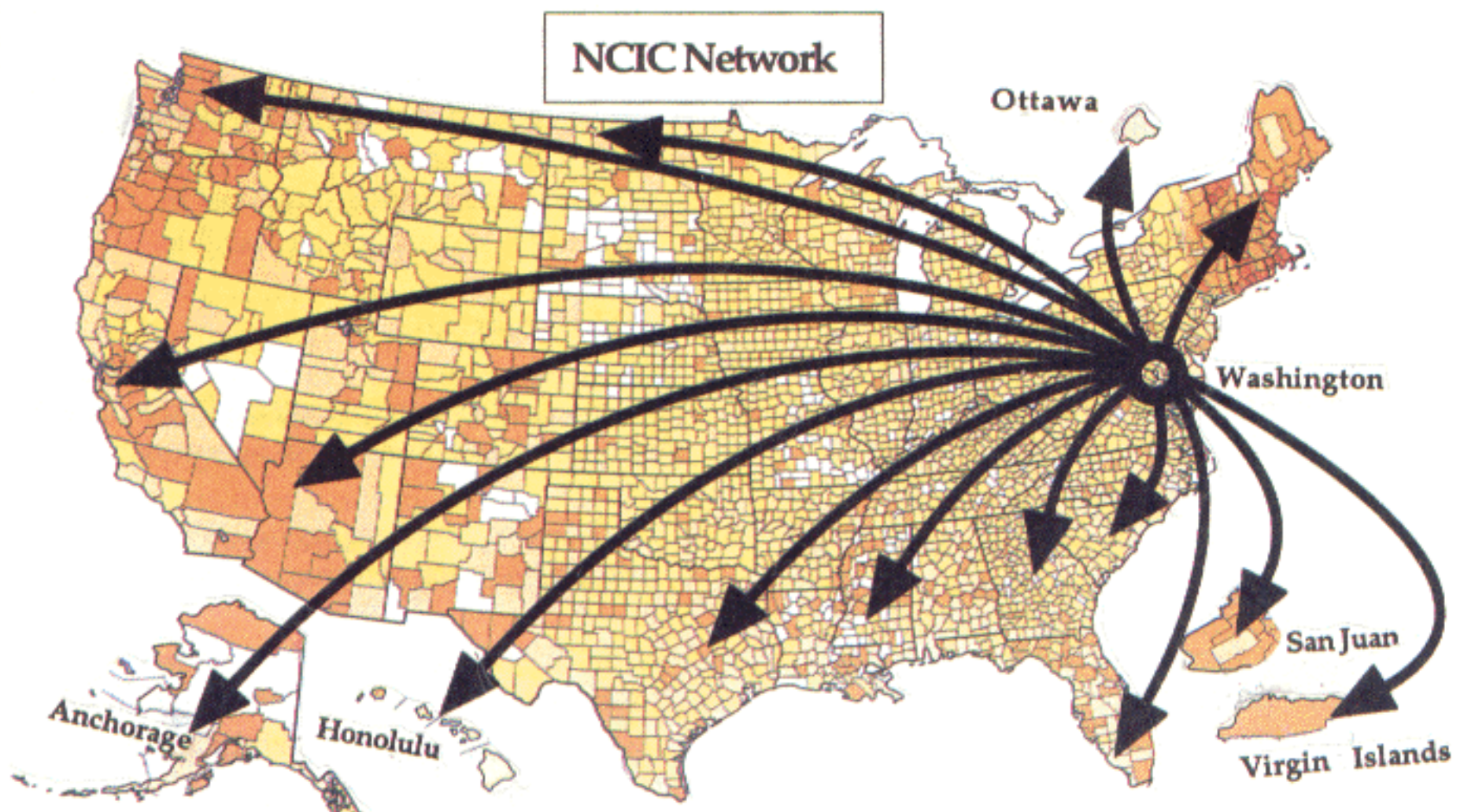
Note:

All reported statistics are based on receipts and file holdings as of November 1992.

Automated Improvements

The Uniform Crime Reporting (UCR) program was conceived and implemented in 1930. At its inception, the UCR program provided an accounting of the extent and nature of criminal activity and served as an administrative tool for criminal justice leaders to better manage their departments. Today, more than one million items of data are collected from over 16,000 law enforcement agencies on a voluntary basis. These agencies represent jurisdictions covering over 96 percent of the U.S. population. Reliance on UCR data has expanded and now includes legislators and scholars. The benefits from this program are indeed significant and have resulted in an increased understanding of the crime problems which confront the country.

The National Crime Information Center (NCIC) is a nationwide computer-based inquiry/response information system established in January 1967 to service the criminal justice community. NCIC's purpose is to maintain a computerized filing system of accurate and timely documented criminal justice information readily available through a telecommunications network. Inquiry response activity averages 1.3 million transactions per day through over 100,000 terminals.



In 1990, the Machine Readable Data (MRD) project was established. Through the MRD, states were contacted and encouraged to submit disposition information by tape for entry into the FBI's automated data base. The MRD enhances the FBI's ability to post dispositions and, thereby, provide a more complete and accurate criminal history record to the criminal justice community.

Another automated improvement is the Identification Division Automated Services (IDAS) system. The IDAS system maintains a name index and fingerprint index to arrest records of twenty-five million subjects arrested throughout the United States. An average of 35,000 fingerprint cards and 100,000 Interstate Identification Index (IIT) on-line transactions are processed daily.

For additional information on the above services, contact the User Services Section, CJIS Division, FBI Headquarters, telephone number (202) 324-5456.

Research and Development

In 1989, the FBI and other criminal justice representatives coordinated efforts to develop a conceptual road-map to revitalize the FBI's criminal justice information services to meet the needs of its users into the next century. Major initiatives, resulting from these efforts, include the Integrated Automated Fingerprint Identification System (IAFIS) program, the enhancement of the NCIC to NCIC 2000, and the enhancement of the UCR program through implementation of the National Incident-Based Reporting System (NIBRS).

Purpose

The IAFIS program is the development and implementation of a technologically advanced, automated criminal justice information services system based upon image capture, storage, and retrieval. The key concept is the electronic submission of fingerprint images, rapid search, identification, and response while an offender is still in custody. This involves the total elimination of fingerprint cards at every stage of the process.

NCIC 2000 is the enhancement of the current operational NCIC system. NCIC 2000 will incorporate advanced technologies such as the capture, transmission, retrieval, and printout of fugitives' photographs and fingerprint images; remote (patrol car) searching of a fingerprint image against a fugitive and missing person fingerprint data base; enhanced data retrieval techniques (improved phonetic name search); the development of prototype work stations and mobile imaging units; and on-line access to other systems (Federal Bureau of Prisons and the Canadian Police Information Centre).

NIBRS is the enhancement of the current UCR program and is an incident-based reporting system, meaning data is collected on each single crime occurrence and its components. Reporting guidelines have been developed and distributed to the criminal justice community. Implementation is complete in six states, and in testing, development or planning stages in 40 other states.

IAFIS Components

The IAFIS will consist of three integrated major systems:

- **Identification Tasking and Networking (ITN):** the submission of electronic fingerprint images via NCIC or mailed fingerprint cards for identification purposes by fingerprint examiners.
- **Automated Fingerprint Identification System (AFIS):** an automated approach for performing fingerprint comparisons for the identification of criminals.
- **Interstate Identification Index (III):** the national system for the exchange of criminal history records, supporting the implementation of the National Fingerprint File (NFF) concept.

Enhanced Services

For more than the past half century, the partnership between the FBI and the criminal justice community has significantly contributed to the ongoing battle against crime. Current trends and developments indicate that fingerprint identification will play an even wider and more significant role in criminal and noncriminal processes in the years to come.

Through our revitalization initiatives, the FBI will improve upon that partnership by:

Eliminating fingerprint card submissions and providing rapid search, identification, and response to electronic fingerprint images;

Having the capability to process an average of 73,000 electronic fingerprint submissions per day;

Developing and implementing an on-line Interstate Photo System to provide mugshots;

Updating the current operational NCIC system through the NCIC 2000 project, to provide more complete and timely information to the criminal justice community;

Implementing new guidelines for the comprehensive collection of data through a new program known as NIBRS, which is an upgrade of the current UCR program;

Establishing the NFF, which will reduce the duplication of effort and cost for criminal history record keeping at the state and national levels;

Developing and implementing the Felon Identification in Firearms Sales program, which will permit criminal justice agencies to screen applicants for firearms and related permits;

Producing better management and statistical reports for the criminal justice community to better manage its resources, for legislators to devise the necessary legislation to combat crime, and for scholars to have a better understanding of the seriousness of crime and its impact on society.

For further information, please contact the Requirements Management Section, CJIS Division, FBI Headquarters, telephone number (202) 324-5084.