



INTERPOL

DISASTER VICTIM IDENTIFICATION GUIDE

ANNEXURE 4

PHASE 2 > PM

NOVEMBER 2023

Wherever possible, the mortuary station should be established in consultation with the head of the Victim Identification Unit. It may be necessary to set up a security service to protect operational personnel, the facility and human remains against access and or disturbance by unauthorized persons.

The mortuary station performs the following functions:

- Reception of human remains from the Recovery Command Centre; issues a receipt to the Recovery Command Centre (chain of custody)
- Storage and proper cooling of human remains as appropriate
- Organisation and transport of human remains for forensic examination in consultation with cooperating Funeral Directors and/or body transport teams
- Registration of human remains for the purpose of documenting the site of discovery and the location of each remain at any given time for tracking purposes
- Organisation of the return transport for human remains
- Quality assurance check of identified human remains prior to release to a mortician
- Workflow documentation.

A receiving point that is set up at the mortuary station is responsible for all incoming/outgoing human remains and reviewing accompanying documents (e.g., recovery records) for correctness and completeness.

4.1. Purpose of the PM Process

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The objectives of an PM are to:

- Satisfy legal requirements of the respective country.
- Establish cause, manner and mechanism of death.
- Determine survival time leading to death.
- Collect data for Identification purposes.
- Document key information including injuries and evidence for investigation purposes.

4.2. Transporting Human Remains

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If Funeral Directors are unavailable to transport the remains, a transport team should be designated and assigned responsibility for the movement of the remains to and from the mortuary station. Human remains should be transported in vehicles or on gurneys or tables. Records of all movements should be kept.

4.3. Mortuary Facilities

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Wherever possible, existing facilities should be used for examination of human remains. If such facilities are unavailable then the site selected should meet certain minimum requirements, i.e., availability of running water, drainage or collection and removal of water waste, and electricity as well as compliance with all health and safety regulations. Separate stations should be set up for the following operations:

- Reception of human remains.
- Forensic examination of human remains - (autopsy)
- Dental examination
- Medical Imaging (including whole body scan if possible)
- Fingerprinting, friction ridge examination
- DNA collection
- Evidence processing – photographing of secondary characteristics e.g., tattoos, scars, property.
- Quality control

- Release of examined human remains.

Separate areas should also be set up for the following functions in the vicinity of the body examination station:

- Dressing rooms
- Refrigeration storage rooms for human remains
- Storage rooms for logistical and other equipment and supplies
- Decontamination rooms
- Toilets, washing facilities
- Break rooms and dining areas.

An example of a Mortuary layout and Human Remains Processing layout are attached to this annexure at Fig. 1 and Fig. 2.

4.4. Numbering System for Human Remains

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A single unique number is assigned to each body or body part. If several international DVI teams are working together in each response, and if a pre-numbering scheme for the bodies is not established, the international telephone country code of the team that finds and recovers the body should be included as part of the number. (e.g. for a team from Germany, the number would commence with 'PM49', or Australia 'PM61' followed by the next available unique number and possibly a scene number, if deemed appropriate by the Victim Identification Unit).

4.5. Cooling Human Remains

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The influence of the PM interval, exposure of the human remains to the elements, time and climatic factors (high humidity, high temperatures) on human remains accelerate the process of decomposition. As decomposition progresses, important identification features may be adversely affected, destroyed or lost.

In many cases, the storage capacities available at a major forensic medical institute or mortuary will be sufficient. Funeral Directors and traditional body recovery/transport personnel, as well as large local cemeteries and crematoriums, also have cooling facilities.

It may also be necessary to develop appropriate solutions in consultation with local authorities (e.g., temporary mortuary suppliers, ice skating rinks, decommissioned refrigeration facilities, underground parking garages, vacant factory buildings, refrigerated transport containers and/or refrigerated vehicles, portable air conditioning systems).

Bodies should be cooled at 4-6°C. Only when long-term storage is foreseen, human remains should be kept at sub-zero temperatures (-14°C) and allowed to warm to 4-6°C before examination. A list of bodies placed in each cooling container is to be affixed to the outside of the container and maintained in a central registry. This list should be regularly maintained and updated as the DVI process progresses to ensure continuing accuracy.

Dry ice causes skin burns and consequently should not be placed in direct contact with human remains. A low wall approximately 0.5 m high can be built around, for example, approximately 20 bodies and covered with a tarpaulin or tent. Approximately 10 kg of dry ice is required per body per day. However, this provides only a temporary cooling facility and body deterioration will continue, albeit at a reduced rate. No attempt should be made to cool human remains with ice (frozen water), as ice and water from melted ice may damage both the bodies themselves and personal effects, including identity documents. It may also become an occupational hazard for examining personnel especially in the presence of slippery surfaces.

4.6. Examination of Human Remains

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During PM examination of human remains, it is essential to ensure that only unavoidable changes are made to those remains examined. If there are reasons to depart from accepted examination

practices, the governing authority for the DVI operation should be notified.

The methodology used during the PM is determined on several grounds:

- Complete PM is often needed in cases of homicide, unknown cause of death, flight crew members, and unidentified remains.
- Description of external injuries including the distribution of injuries or burns relative to anatomical regions of the body.
- Description of internal injuries including fractures, internal bleeding, upper respiratory tract changes (e.g., trauma, soot from fires in lungs).
- Previous surgical procedures and internal implants: bone, breast, heart, uterine IUD.
- Recording of anatomical peculiarities.
- Collecting samples for toxicology and DNA.
- In the case of decomposed bodies, it may be valuable to de-flesh parts of the body such as the pubic symphyses, medial ends of clavicles, femur, and skull, to assess ethnicity, age, sex and stature. However, the use of medical imaging, especially Computer Tomography (CT) scanning, may obviate the need for this process.

4.7. Key Personnel and Functions

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PM Coordinator

The PM Team Leader ensures that sufficient personnel are available for examination of human remains, supervises PM activities and checks for compliance with occupational health and safety requirements, and quality assurance processes. Close collaboration with the forensic pathologists is advised.

Human PM Remains Registrar

The human remains registrar assigns PM numbers. If the PM number has not already been assigned, the photographer should be requested to photograph the human remains to record what has been received. PM numbers should then be allocated on the PM forms.

Friction Ridge Specialists

Depending upon the condition of the human remains, friction ridge specialists will determine the best method of collection to be used. If possible, fingerprints, palm prints and footprints should be taken from all victims, especially babies and young children (e.g., barefoot latents could be developed as AM data in the bathrooms, kitchens etc. for the homes of victims).

Photographers

General principles for the photographing of human remains:

- Photographs (digital wherever possible) should be made of each human remains.
- Every photograph should bear the PM number and, if possible, a reference scale (e.g., for tattoos, scars, small effects).
- The subject of the photograph should fill the entire frame, if possible.
- Human remains should be photographed both clothed and unclothed.

The following photographs are required:

- All markings, labels and numbers on body bags.
- Full-length photographs of the body / human remains.
- Two overlapping photographs showing the upper and lower halves of the body, respectively.
- A full-frame front view of the head (portrait view).
- An overhead view taken at 90-degrees to the body / human remains.
- Images of all unique features, such as scars, tattoos, amputations, piercings, etc.
- All articles of clothing and personal effects, initially in-situ, then cleaned and photographed with a macroscopic lens in front of a non-reflective background to display details, such as

inscriptions/engravings on rings, wristwatches, etc.

- All individualising features, such as clothing labels and credit card numbers.
- Views of the teeth: front view with teeth closed and lips retracted; upper jaw showing biting/chewing edges of teeth; lower jaw showing biting/chewing edges of teeth; and lateral right and left views with teeth closed and lips retracted. The dentist should be consulted regarding the specific dental photographs required, such as close-up photos of specific dental treatments or unusual findings that are useful for identification purposes.
- If the body is skeletonised, then views of the skull from all directions (anterior, posterior, superior, lateral, inferior) using scales, and an overall view of the skeleton, should be included. Also, the anthropologist should be consulted regarding specific photographs required that are useful for identification such as close-ups of the pubic symphyses and any AM injuries etc.
- Specific diseases and abnormalities at the request of the forensic pathologists.

All photographs of human remains are to be stored on permanent media system that is labelled with the PM number from that body and stored in the PM file. These photographs should also be backed up in a secure reliable digital storage device (e.g., external hard drive, server or equivalent).

PM imaging

PM imaging such as Radiographs (x-rays), and Computed Tomography (CT) scans are important to assist in finding clues to the cause of the incident (e.g., in the case of bombings) and in determining the cause and manner of death. Whole body imaging is recommended and may assist in identification by locating internal implants in bone, breast, heart (for example pacemakers), uterine IUD, etc. PM imaging may provide invaluable information to record identifying features that can be reliably compared with known AM data. If forensic imaging specialists are deployed, they work under the responsibility of forensic pathology. A systematic imaging examination of the human remains (especially using CT scanning technology) is conducted to:

- Record potential identifying features, including internal observations, such as certain medical conditions and evidence of previous surgery for example surgically absent appendix, gallbladder or uterus
- Identify injuries, pre-existing disease processes or abnormalities.
- Search for teeth and bones or bone fragments.
- Search for foreign objects (metallic items, explosives devices, firearm projectile, and jewellery).
- Evaluation of injuries (cause and manner of death).
- Estimation of age at the time of death.
- Depict and record treatments in teeth (and bones) useful for identification.
- AM/PM radiological comparisons.
- Conform with established search guidelines for the bodies of flight crews (examination of head and feet).
- Collaborate with forensic anthropologist to provide radiological views, and interpretation of them, to produce a biological profile, including estimated age, sex, ethnic affiliation, height and weight and depict unique features for comparison purposes.

Forensic Pathologists

The forensic pathologist performs the external and where indicated, the internal examination of the body and enters appropriate data in the fields provided in the PM record. In many circumstances an internal examination is not required. The forensic pathologist usually takes samples for DNA analysis. A forensic anthropologist can provide critical information for a biological profile of a given deceased person, e.g., age, sex, ethnic affiliation, stature and individual identifying features. These parameters can be assessed based on analyses of body structure and body size. The forensic pathologist decides on a case-by-case basis whether an anthropologist should be consulted. In addition, the forensic pathologists advised the PM coordinator on mortuary management and assists in supervising PM activities.

PM Assistant

The PM assistant assists the forensic pathologist in the external and internal examination of bodies. The assistant performs the following tasks in consultation with the forensic pathologist:

- Cleaning of instruments.
- Assisting in positioning the human remains on the PM table.
- Assistance in the external examination of the human remains (lifting limbs, turning the body, cleaning specific parts of the body or body parts).
- Assistance in the internal examination of the human remains.
- Assistance in the collection of DNA samples.
- Exposure or recovery of important identifying features with some left in-situ for photographic documentation (e.g., artificial hips, heart pacemakers, implants).
- Reconstruction of the body after PM to a condition acceptable for presentation to the family.

PM Recorder/Scribe

- The PM recorder guides the forensic pathologist through the PM recording process and asks for information for each data field in the form.
- The recorder follows a step-by-step procedure to avoid overlooking important information.
- The PM recorder completes the PM report in accordance with the instructions provided. The recorder should ensure that all entries are legible, all pages and fields are completed and all entries are made in the relevant columns.
- The recorder ensures that the photographer records the identifying features as indicated by the forensic pathologist. Upon completion of the autopsy, it is important that all relevant signatures are obtained from the various disciplines and are clearly legible on the relevant PM documentation.

Property / Evidence Processors

The evidence or property processor fills out the pages of the PM record and lists all articles of clothing, jewellery and other effects. A second evidence processor cleans the objects and displays them so that they can be photographed. They then place the objects in appropriate evidence bags, label the bags with the unique PM number from the human remains and store them with the human remains, or accordance with local DVI response protocols/Standing Operating Procedures.

Personnel for Odontology

As a rule, two or three odontologists cooperate in the recording of the PM dental status of the body and in producing the radiographic and photographic record. One is the forensic odontologist examiner and the others are the forensic odontologist recorder and/or forensic odontology radiographic assistant. After the data is collected, this team rotates positions and then repeats the examination to ensure precise and accurate data through a double-check quality control system, while closely observing each other's examination and checking of data entries.

Forensic Odontology Examiner

The odontologist examiner is the dentist who accesses the oral cavity using the necessary procedures, including but not limited to incising soft tissues as required; cleaning the teeth and jaws; examining the structures; and assessing the dental status of the body.

With respect to accessing the oral cavity for PM examinations, forensic odontologists should, in cases of identification, be free to suggest the methods to secure optimal conditions for the examination. But the procedure chosen for examination, should be in accordance with the decision of the country responsible for the identification.

As a general principle, the jaw should not be removed from the body. Removal of the jaw may be undertaken only when necessary and justified through prior notification to the legal or controlling authority involved in the DVI response and/or jurisdiction. In cases where surgical access is approved, removal of the upper jaw should be avoided if possible. When a jaw is removed, it should be always kept with the body. The jaw should be repositioned in or on the body so that the family members can appropriately view the repatriated body.

Radiographs of the teeth are produced as follows:

- Molars on both sides with jaws together (bitewings).
- Upper and lower molars, and possibly premolars and incisors on both sides (periapicals).
- Teeth with special features, such as root canals, crowns, etc.
- Others radiographs as required (e.g., occlusals, lateral oblique mandible).
- Orthopantomograms (OPG).

CT scan images can be adjusted to recreate many additional views such as OPGs.

These radiographs are evaluated for quality (exposure, density, sharpness) and are then studied by the odontologist recorder (see below) to ensure all data from them are included on the PM pages. The odontologist examiner also supervises and directs the production of an adequate photographic record of the teeth, jaws, related oral structures and individualising dental traits/characteristics.

Forensic Odontology Recorder

The odontologist recorder is the dentist who assists the odontologist examiner to record the victim's dental status. The odontologist recorder prepares and completes the relevant PM forms and records the dental data as dictated by the odontologist examiner; checks the post-mortem record for quality (accuracy, legibility, clarity); signs the record and ensures that the odontologist examiner and odontologist radiographic assistant also signs the record.

Forensic Odontology Radiographic Assistant

The odontologist radiographic assistant assists the odontologist examiner and odontologist recorder in preparing, exposing and developing radiographs of the teeth and takes joint responsibility for the quality of the PM radiographs with the other odontology team members.

Quality Control Officer

Prior to the movement of any records, all documentation should be closely examined and assessed to ensure that the data has been accurately recorded.

4.8. Examination Procedures

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Following receipt of the human remains and the recovery record, the remains are placed on an PM table and the following examination procedures undertaken.

- The body registrar issues PM numbers (if not already issued) and records it on a blank PM form. If a specific recovery number has been assigned, this number is recorded on the PM form.
- The body registrar gives the PM record to the PM recorder/scribe.
- The body registrar enters the PM number on the recovery report and gives any existing effects, sealed in evidence bags, to the property processor.
- The body registrar directs the photographer to document the body to record what has been received.
- The photographer photographs the clothed body / human remains.
- A property/evidence processor, assisted by the PM assistant, removes the clothing from the body / human remains and cleans clothing and other items of evidence (NB: cleaning should not occur until all specialists have completed their evidence collection procedures). The evidence processor should also document the locations where each item of evidence was found.

- The photographer photographs the unclothed body / human remains plus the items of clothing and other evidence.
- The external and internal examination of the body is performed and DNA samples are collected (forensic pathologist, PM assistant and PM recorder) directs the photographer to photograph important identifying features.
- To assess dental status, the forensic odontologist, odontologist record and odontologist radiographic assistant examine the body and record data following instruction. The forensic odontologist directs the photographer to photograph identifying features.
- Collection of fingerprints, palm prints and footprints is completed by the friction ridge specialist.
- Documentation of clothing, jewellery and other effects is completed by the evidence processor and photographer. At this point, evidence is placed in separate evidence bags (e.g., objects found in wallets), labelled with the body's PM number and stored with the body or according to local DVI protocols/SOPs.
- Once the examination of clothing is completed, clothing is placed in a clear bag and inserted into the body bag. Items of identification, objects of value and jewellery are taken to an evidence storage room appropriately labelled and tagged for continuity to allow later re- association of these valuables with the identified body for release and repatriation.
- Performance of quality control measures.

4.9. Special Considerations for Primary Identification Methods

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PM Friction Ridge Impression

The completion of the friction ridge examination of the victims should rely on the fingerprint examination experts within the events jurisdiction. Many methods are used in the processing and examination of finger and palm prints. These can include digital photography, ink, powder processing and transparent slides.

If transparent slides (clear acetate sheets) are used they should be labelled in advance and then placed face down over a translucent original on a table.

In preparation for fingerprinting, the fingers and hands are cleaned with water or a soap emulsion and dried with a cloth or cellulose towel (being careful to avoid fibres or contaminants from the drying material being embedded into the ridges). Cleaning the hands with alcohol first will result in much better prints. The alcohol softens the skin and makes the skin more pliable. Wipe with alcohol and then hold in front of a small fan to dry quickly.

Depending upon the condition of the hands, different procedures will be needed. The fingers (if the surface skin is still attached), the separated surface skin (pulled over the specialist's finger) or the dermis (after dabbing with acetone) are dusted with fingerprint powder using a brush (zephyr, fairy hair or cosmetic).

Then the protective backing is removed from a white Herma adhesive label (size 32 mm x 40 mm) and the label is laid in a body pan with the smooth side down, so that the adhesive side faces upward.

The individual prints are then taken with the body pan, checked for viability and then adhered from right to left (thumb on the right, little finger on the left) to a prepared transparent slide.

Finally, the slide is reversed. The result is a set of normal friction ridge impressions (positive and colour-accurate) on a white background.

Palm Prints

If the surface skin has separated, the area of the palm is cleanly cut out, cleaned, spread over a dry cloth and stretched. Following drying with alcohol wipes, apply fingerprint powder, then the adhesive side of a white adhesive label (cut to size in advance) is pressed against the palm, beginning on one

side and then carefully proceeding toward the opposite side. The adhesive effect is to prevent slipping. Then the label is affixed to a new transparent slide. Avoid excessive pressure and consider a “second” adhesive label being applied as the first attempt may clean away more debris and equalize the powder distribution, making the second attempt a better result.

When the slide is reversed, normal palm papillary images appear.

If the surface skin is destroyed or unsuitable for impressions, the dermis is cleaned, dabbed with acetone and processed with fingerprint powder. To obtain a palm print with the aid of a Herma adhesive label, an assistant should hold the hand so that the other specialist can extend the label carefully, beginning with the carpus, into the hollow of the palm with a cloth or his own fingers. The label is then carefully removed and affixed to a prepared transparent slide.

Depending upon the condition of the skin, footprints are collected in the same manner as palm prints.

Improving Hand Condition when Skin Surface Separated

The first step is to wash the hands with alcohol. The hands are then immersed for approx. 10 seconds (depending upon their condition) in a basin of hot water (boiled immediately beforehand). After the hands are removed from the water, a significant change in the hand or skin is already evident. However, because the hand curls inward because of the “boiling” process, it should be restored to an extended position by stretching. The finger pads and palms are now much more rounded; the skin has refilled (rehydrated) and is soft and expandable; the wrinkles caused by desiccation disappear and the papillary lines are visible once again. The skin is then treated with acetone and with fingerprint powder. Prints are taken with adhesive labels (adhesive side). The resulting prints are better than those obtained from the dermis without the boiling method, as they exhibit stronger contrasts.

This method is of limited use when the dermis exhibits various injuries. NB: The boiling process causes the skin to rupture if left more than 10 seconds in the water, and the “boiled” tissue beneath the skin swells to the surface.

Photographs document the “hand boiling” procedure and show two examples of fingerprints taken after “boiling”

		
Condition of the hand after boiling: Skin is filled out, double-rowed papillaries are now visible	Thumb and index fingerprints (right hand) following boiling, dying with soot powder, fingerprinting with adhesive labels and affixing to a transparent slide.	
		

PM DNA Samples

Decisions regarding procedures to be used in sample collection as well as the scope and purpose of sampling measures should be made as early as possible.

The success rate for DNA typing depend on how quickly samples are obtained and preserved. A reduced PM interval is advantageous. Sample collection at the disaster site should be only performed

in accordance with the collection of forensic crime-scene evidence and should provide for documentation, proper labelling and preservation of the chain of custody. During sample collection, a forensic biologist or forensic pathologist with basic knowledge of forensic DNA methods should be present to provide guidance for sample collection.

Depending upon the condition of the body, different types of tissue are collected (See: *Table 1*). In many cases, the forensic pathologist requires advice on specific issues.

Whole blood from the core of the body, deep muscle tissues, bones or teeth are the most reliable sources of DNA especially where considerable time has elapsed since death and where the weather conditions have been unfavourable. However, other resilient samples such as nail bed tissue or internal samples like swabs of the bladder lining may also prove effective sources of DNA. Note that the outside of bodies and body parts can be contaminated with DNA from other victims. When sampling body parts it is important to ensure that contaminating DNA and generation of mixed DNA profiles is avoided. Therefore, a sample should only be collected from deep (muscle) tissue by e.g., cutting into the tissue and should not be collected by rubbing a swab on the outside of a body part. For illustrations, we refer to De Boer et al., *Forensic Science International* 289 (2018) 253-259.

It might also be advisable to separate the collection of DNA samples from the rest of the PM examination (dental, fingerprint and physical examination) if that will result in better (less decomposed) samples and a more convenient sample collection procedure (e.g., blood on DNA collection card). It is important, however, that all samples are properly labelled according to given standards and that the chain of custody is not broken.

Bone material from the spongiosa can be rich in DNA, although it may be difficult to preserve reliably. Consequently, dense cortical material may be the better choice, preferably from the long leg bones and ribs. When collecting samples from bones, it is important not to remove them from anthropological measurement points, articulated edges or fracture edges.

In the case of severely decomposed remains, it is important to ensure that the samples taken are of especially good quality. Bone or tooth samples should be taken in all such cases. Even though the success rate is lower, simpler sample collection methods may justify a certain percentage of unsuccessful attempts. This should be weighed carefully against the additional burden of sample matching/verification and the necessity of marking unsuccessful samples for repeat processing. This is a complex issue that requires careful planning and quality control procedures.

Note that if tooth samples are to be taken for DNA analysis, this should only be done after consultation with the forensic odontologist and preferably only after the odontological examination has been completed.

For cases involving intact, fresh or undecomposed bodies, you could consider collecting samples that are easier to obtain (e.g., smears on DNA collection card) in addition to bone samples. In any event, it is advisable to collect multiple samples from the outset to avoid the time-consuming work of collecting and labelling new samples at a later point in time. In view of the possibility that victim identification may take considerable time, the issue of preservation of remains during storage arises.

Complete documentation of each DNA sub-sample and the body parts from which they are taken is also of crucial importance for quality control of the matching of remains. It is therefore recommended that morgues be equipped with collection containers for PM samples.

Preservatives can be used to conserve soft tissue at room temperature. The use of preservatives in provisional mortuary stations with limited cooling capacities is recommended. Please note: Samples should not be preserved in formalin, as formalin will destroy DNA. A recommendation is to preserve soft tissue in ethanol (ethyl alcohol, grain alcohol, drinking alcohol) or in a solution of water saturated with salt (NaCl, sodium chloride, kitchen salt).

Even when a victim has been identified based on other methods, a DNA sample should be taken for the purpose of matching or ruling out matches between body parts and to facilitate the identification of other missing persons within the DNA database.

The numbering system used for PM samples may be based on internally applied standard procedures. Regardless of the specific scenario, this number should be unique and traceable. If an internal

numbering system is used for DNA (or any other laboratory procedure), there should be rigorous adherence to matching this numbering system to the general PM numbering system. This allows the use of the laboratory results in the general DVI reconciliation process.

In cases of a disaster with large numbers of dead and mutilated bodies, the forensic pathologist should specify procedural criteria for examinations, including such things as whether the examinations should be restricted to anatomically recognisable remains, and/or a minimum size should be set for soft tissue fragments that are to be identified and repatriated. It is important to ensure in this context that mutilated remains are recovered separately and assigned individual numbers without reference to presumed matches.

With respect to the problem of mutilated remains, a mixing of body parts may impair the integrity of samples. Mixing in this sense is defined as the transfer of blood or tissue from given body parts to other remains in the aftermath of a large-scale disaster or possible contamination with other human or animal substances, which could result in false DNA matches. It is therefore recommended that multiple methods be used for each identification.

The possibility of cross-contamination between remains should be taken into account both at the disaster site and at the PM station – therefore every individual body or body part should be assigned a separate number. Remains should not be matched or placed together with other remains simply based on external appearance.

Samples selected for DNA analysis should be taken from human remains that have been matched definitively with the other remains. It is essential not to regard individual tissue or bone fragments as representative samples. Another problem that arises when dealing with fragmented remains is the possibility of cross-contamination from remains of animal origin. Pre-sorting and exclusion of samples that do not originate from a human source are the responsibility of an appropriately trained forensic anthropologist or forensic pathologist.

Samples should be sent for analysis as soon as possible. Most importantly, samples should be kept cool, and shaded from daylight from the time of collection until receipt for analysis.

Table 1: Collection of PM Samples

Condition of body	Recommended sample
Complete, non-decomposed corpse	Blood (on DNA collection card or swab), and saliva (Buccal, oral) smears
Mutilated, non-decomposed corpse	If available: blood and deep-seated red muscle tissue (~1.0g)
Complete, decomposed corpse or mutilated remains	- Sample from long, compact bones (4-6 cm sections, window section, without shaft separation), or - Healthy teeth (preferably molars), or - Any other available bone (~10g, if possible; preferably cortical bones with dense tissue)
Severely burnt corpses	- All samples listed above and impacted teeth or tooth roots if present, or - swabs from the bladder.

NB: It is advisable to collect more than one sample to provide a range of testing options.

PM Dental Examinations

During the assessment of dental status, FDI nomenclature should be used for national and international DVI operations. Internationally harmonized terms, codes, abbreviations, and nomenclature are to be used on INTERPOL DVI forms for international DVI operations. This data is recorded on INTERPOL DVI forms to standardize the national identification response.

When dealing with conventional radiography (film-based x-ray images), exposed films are to be labelled and numbered individually and then placed in numbered envelopes or bags. After development and adequate fixation, the radiographs are to be checked for quality, labelled, mounted, numbered and sorted into numbered sealable or self-sealing bags. It may be necessary to obtain additional radiographs of specific features discovered during the dental examination.

A quality control system should be followed to ensure adequacy of the PM radiographic images. It is important to ensure that the case data (e.g. numbers) from the label is exported with the images so the data is available at the time of reconciliation.

The victim's upper and lower jaws should be left in place and should not be removed since this is a destructive procedure that further mutilates the victim's body. Many family members wish to exercise their right to view even badly decomposed bodies of loved ones. The disarticulations that are typically completed in chaotic DVI situations tend to be carried out with crude instrumentation and techniques that lead to fracturing of facial bones adjacent to the upper jaw.

Consideration might be given to removal of the jaw or jaws in very exceptional circumstances. Adequate justification for this should be presented by the odontology examiner to the supervising dental manager at the PM site before any action is taken. When the supervising dental manager agrees with the proposal, authority to conduct the procedure should still be sought and obtained from the DVI Commander according to established local and cultural practices. If authority is obtained to remove the lower jaw, every attempt should be made to minimize the extent of surgical intervention and to replace the jaw and associated teeth in its original position at the end of the examination. Every attempt should be made to reduce the risk of loss of these tissues.

Both the detached lower jaw and the attached upper jaw can be cleaned and subjected to precise dental examination and radiography. The advantage of this approach is that maintaining the upper jaw in-situ virtually eliminates the risk of subsequent mismatching. Once the examination is completed, the lower jaw is replaced and the incision closed, if appropriate and/or possible. The jaw should be repositioned in its correct anatomical position for subsequent viewing of the body by family members, even if this seems very unlikely at the time of PM examination.

Fig 1. - Mortuary Layout

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The following diagram is an example of a mortuary facility layout.

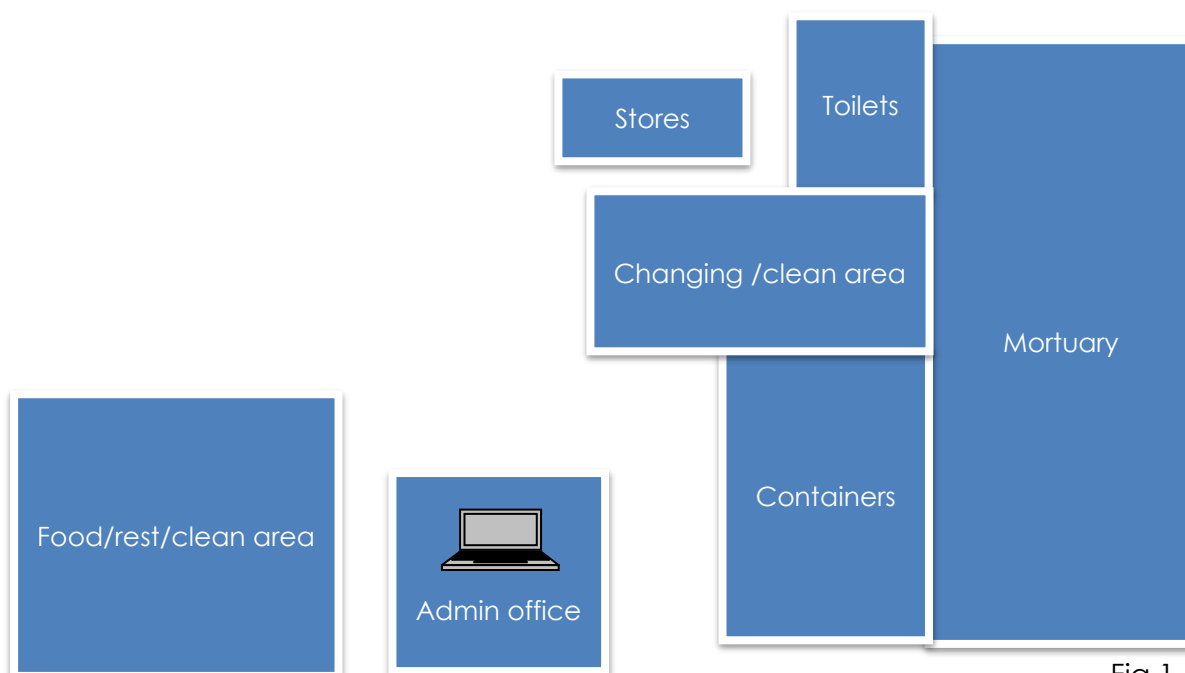


Fig 1

The following diagram is an example of the layout of a mortuary for processing human remains.

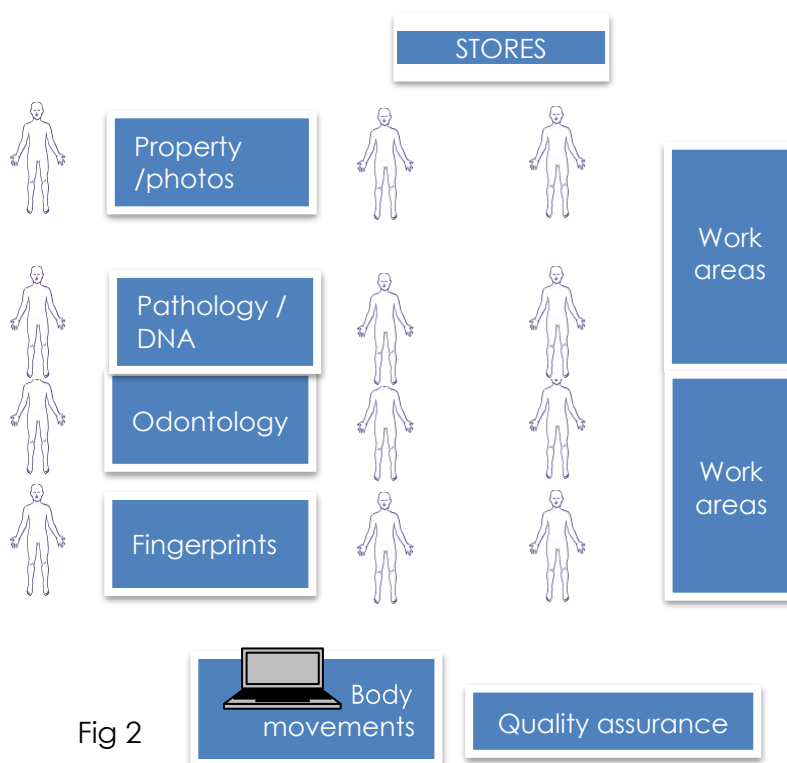


Fig 2