INTERPOL

DISASTER VICTIM IDENTIFICATION GUIDE

ANNEXURE 8

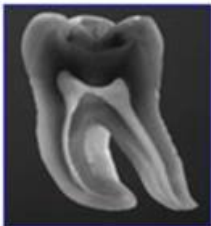### METHODS OF IDENTIFICATION

8.1. Primary Methods of Identification

It has been internationally accepted that primary identifiers is the most reliable method by which identification can be confirmed. These identifiers are 'Friction Ridge Analysis', 'Forensic Odontology' and 'DNA'. The following symbols are widely used to depict the individual methods of identification.

Primary Identifiers		
Friction Ridge Analysis	Forensic Odontology	DNA Analysis

8.1.1. Friction Ridge Analysis

There are three reasons why friction ridge analyses is a reliable indicator of identity:

Friction ridges found on the palmar (palms and fingers) and plantar (soles and toes) surfaces of the human body are unique. Friction ridge formations found on the human body are not repeated on any other person and therefore, this uniqueness enables friction ridges to be used to individualise or exclude persons conclusively.

Friction ridges found on the palmar and plantar surfaces of the human body are persistent from birth unless permanently damaged or from advanced decomposition. Papillary ridges are formed in utero and remain unchanged even beyond death. They grow back in the same pattern following minor injuries, whereas more severe injuries can result in permanent scarring. Such changes can still contribute to an identification or exclusion.

Friction ridge patterns on fingers (fingerprints) can be classified and searched. Because they can be classified, they can be catergorised and registered systematically in a database or collection. Subsequently, impressions can be searched and retrieved easily for comparison and identification.

8.1.2. Forensic Odontology

The unique structures and traits of human teeth and jaws readily lend themselves to use in the identification of living and deceased victims. Dental data can be recovered and recorded at the time of PM examination and compared to AM data that is supplied by generalist and/or specialist dentists who treated the victim during their lifetime. The teeth are well protected in the oral cavity and can withstand many external influences at, near, or after the time of death. Teeth comprise the hardest and most resilient substances in the body, so that when the body's soft tissues deteriorate, the dental characteristics that are so valuable for identification purposes remain accessible. This is especially true of treatments in the teeth, such as restorative and cosmetic fillings and crowns, root canal procedures, implants, fixed and removable prostheses since these are custom-made as unique treatments for each individual. Other anatomical traits can also be compared even when no dental treatments are present, and these also provide useful data for identification purposes.

Conclusions that are available to the DVI odontologists following comparison of PM and AM dental records include:

- Identification (absolute certainty the PM and AM records are from the same person).
- Identification probable (specific characteristics correspond between PM and AM but either PM or AM data or both are minimal).
- Identification possible (there is nothing that excludes the identity but either PM or AM data or both are minimal).
- Identity excluded (PM and AM records are from different persons).
- Insufficient evidence (neither PM nor AM comparison can be made).

In addition to comparing PM and AM records to establish identification, odontologists are also able to provide conclusions about certain aspects of a person's life or lifestyle by examining the teeth. These can be valuable when searching AM databases for potential matches. For example, if the victim is estimated to be a young adult, this might limit the search criteria to certain aspects of the AM database. Human teeth progress through various stages of development from *in utero* to adult life and these stages of development and tooth 'eruption' can be used to estimate the chronological age of the body at the time of death. Teeth and jaws may contain congenital and/or acquired traits that are useful in determining a person's racial background, dietary and eating habits, and oral hygiene practices. It might be possible, based on the type of dental treatment present, to establish the probable country or region of origin for a given victim. These can then be used to limit or restrict the database to search for possible AM data for a given body.

8.1.3. DNA Analysis

DNA material is a proven source for identification, as a significant portion of the genetic information contained in a cell is unique to a specific individual and thus differs – except in identical twins, from one person to the next.

DNA testing can be performed even on cases involving partial or severely decomposed remains.

DNA matching is the best way to identify body parts.

DNA analysis can be automated ensuring maximum quality and rapidity of high -volume testing.

DNA matching can be based on profiles from biological relatives, self-samples or belongings and is the only method for primary identification that is independent of direct comparison (e.g.: fingerprint records, dental records).

DNA analysis requires a sample to be taken from the deceased body or body parts as well as from known reference material/source for comparison. The samples need to be sent to an accredited laboratory and analysed according to international standards and the profiles compared with the known reference samples (acknowledging that these may not be identical if originating in a biological relative).

8.2. Secondary Methods of Identification

Secondary identifying features have been regarded as secondary in quality whereas this is a temporal definition. Whilst primary identifiers may each individually, or in combination provide an identification of the deceased, secondary identifiers tend to be used when primary identifiers have failed to secure a verifiable identification. Secondary identifiers in combination may provide sufficient information to make identification in selected cases, and where access to primary identifiers may be limited or absent, they may be the only means whereby the deceased can be identified. It is therefore imperative that AM data collection does not neglect the information to be gained from the secondary identifiers.

Secondary identifiers may be particularly useful in a closed disaster. An open disaster will require more lines of evidence with greater individuating power than closed incidents.

8.2.1. Medical Information

The ante mortem medical information consists of a basic personal description (age, sex/gender, height, ethnic affiliation) and specific distinguishing medical features. Medical information, such as scars, evidence of disease or fractures or surgical procedures may provide crucial information about a victim's medical history. Even common types of surgery that exhibit few individual characteristics (e.g., appendectomy) should be taken into account. Unique numbers found on heart pacemakers and prosthetic devices are reliable identifying features. Tattoos, moles and disfigurations may also serve as indicators of identity.

Data for a general personal description can be sourced from next of kin, but detailed medical information requires access to medical records. Ante mortem radiology images are of particular interest since they can be compared to post-mortem imaging. Within the AM team the medical information is mainly interpreted by medical professionals, but it may also be advisable to engage the services of a forensic anthropologist in the medical AM collection team.

8.2.2. Pathology

In the mortuary, the pathologists will perform a detailed external and -if needed- internal examination of the body to record all medical findings that may aid the identification of the deceased. Radiology can greatly assist in this process.

In general, features to be noted are those that deviate significantly from what is common in the general population for it to be identifying. Such features are potentially numerous, but since it is impossible to predict which features will prove valuable, a detailed description with photography of all potential identifying features is advised.

Examples of potential identifying external features include typical facial features; visible effects of disease or trauma (including scars from disease, trauma, or previous surgery); bony deformities; skin tumours; or hernias. Examples of cosmetic modifications are piercings and tattoos. Although they may be common in certain groups, they may be sufficiently distinctive to support or confirm identity. Cosmetic surgery may need expert attention to be detected but will usually have left scars that may be hidden in natural openings or in folds of the skin.

If deemed required, internal examination can record signs of previous surgery, such as heart, bowel, or joint replacement surgery. Many implanted medical devices, such as joint protheses carry a unique serial number, which can provide a reliable identification. Pacemakers often carry personal data which can be accessed by interrogation by a pacemaker technician. This can be done externally with appropriate equipment. Alternatively, the pacemaker can be removed and transported.

8.2.3. Anthropology

The forensic anthropologist, as experts in skeletal anatomy and variation, can assist in the collection PM data. Potential features of interest may include sites of previous fracture regardless of whether orthopaedic hardware has been inserted, evidence of diseases and skeletal trauma.

8.2.4. Articles / Evidence / Clothing

This category includes all effects found on the bodies of victims (e.g., jewellery, articles of clothing and personal identification documents).

Engraved items of jewellery may provide important clues to the identity of a victim. It is important to consider, however, that certain items of evidence may not actually belong to a given body (e.g. identity papers may be carried by a different person; items of jewellery or clothing may have been lent to another individual; during retrieval, items may have inadvertently been placed in a single, or wrong, body bag). Items of jewellery have a higher identification value if they are firmly attached to a victim's body (e.g. piercings or "ingrown" wedding rings).

To maximise the benefits of these secondary identifiers, investigators should endeavour to access and record details of the relevant items in minute detail. Although many of these property items may be quite common to the public, identifying several items may provide persuasive evidence in cases where they can be used to corroborate other forms of secondary identifiers mentioned above.