

## QUESTION 2

What part of the patient record from a general dental practice is most useful for identifying the victims of disaster through forensic odontology?

The clinical diagnostic and treatment records of dentists have many uses in a wide variety of legal contexts, but few such situations are more important than those in which we are asked to supply antemortem data for missing persons who might be our patients. When people participate in high-risk activities that result in death or are caught in natural or human-caused disasters, dental records can be an important source of comparative data to establish the identity of recovered bodies. The release of antemortem data by dentists goes far beyond the scope of routine practice and emphasizes the significant societal role that practitioners can play on behalf of Canadian citizens. Increasingly, as dentists learn about the role of forensic odontology in mass casualty incidents, questions arise about the aspect or aspects of a patient's record that are most useful for the purposes of identification and thus the records that should be released to authorities in these circumstances. This article aims to provide insights about how clinicians can determine which records to release so as to provide the most up-to-date and useful data for forensic identification.

### Human Identification Based on Dental Features

Human identification by means of the teeth is based on the premise that each person's dentition contains a collection of unique characteris-

tics, either because of custom-made restorations or because of the numerous anatomic traits that collectively represent the person's unique data set. In some people, especially those who have experienced minimal or no restorative intervention, a combination of these 2 data sets may be needed for comparison at autopsy.

Restorative treatments are considered to provide the best basis for comparative identification. That is because dentists extend cavity preparations, the margins of fixed prostheses and other hard-tissue interventions to encompass decay, fractures or other clinical problems that are specific to the particular patient. These unique extensions are visible on radiographs. If you imagine the shapes of these restorative treatments as 3-dimensional objects separate from the tooth, and then consider the projection of these shapes onto 2-dimensional radiographic film, the resulting radiographic image of the object provides a unique 2-dimensional shadow for forensic comparison. **Figure 1** illustrates the use of the shapes of dental restorative treatments for identification purposes. In the case of a partial or complete removable prosthesis or appliance, the most important way a clinician can assist in any future forensic investigation is to instruct the laboratory to insert the patient's name in the acrylic of the device.

Normal variants in the shape and size of anatomic structures and various presentations of



**Figure 1:** Comparison of antemortem and postmortem bitewing radiographs to establish identification. The film on the left was exposed during the patient's recall exam on January 16, 2007. The film on the right was exposed at autopsy on October 3, 2007, on a body found in a lake.

common morphological traits, taken in combination, also produce a unique collection of identifiers for each individual. Traits such as curved or dilacerated roots, pulp stones, accessory root canals, supernumerary teeth, patterns of alveolar bone trabeculae, periapical inflammatory lesions, periodontal defects and osteomas are not uncommon in the general population. However, when a number of these traits appear together in one person's mouth, the combination of identifiers is usually sufficient for the purposes of forensic comparison.

### The "Best" Forensic Dental Record

Thorough, detailed and comprehensive dental treatment records that document all aspects of the treatment modality provide the best data for comparative purposes. Details of the restorative materials used; the type, location and length of the retentive pin or post; the shades and moulds of prosthetic teeth; and notes about unusual findings or treatments are but a few examples of traits that have been crucial to successful identifications.

The "best" aspect of the dental record to release for comparison with postmortem data recovered from an unidentified body depends on what part of the dental complex is recovered after death. For example, if only part of the victim's jaw is found, then only data from that aspect of the antemortem clinical record is needed. However, at the time a person is reported missing and the authorities arrive at the dental office requesting antemortem data, the type of postmortem data that will eventually become available is not usually known. Thus, there is no way to predict which aspect of the missing person's dental record will be most useful. In fact, *all* aspects of the dental record are potentially invaluable; therefore, all clinical records in the dentist's possession (including working casts, laboratory set-ups, appliances, spare prostheses, but excluding accounting and financial details) should be released to authorities.

Most importantly, only original dental records should be provided for forensic use. This recommendation runs contrary to the belief of most clinicians that they should never release original data to parties outside the practice. The forensic identification of human remains is an acceptable reason for such release. The original records should be duplicated before their release, and these duplicates should be kept on file in the dental office. The clinician should obtain a signed and dated receipt from the authority collecting the original records,

which will be returned to the dentist on completion of the identification process.

The importance of original records in a legal context cannot be overstated. For example, the right-left laterality marker (dimple) that appears on intraoral radiographic films is not visible on duplicate films, so this orientation information is lost when films are copied. Similarly, photocopied charts do not contain the often-crucial multicoloured notations appearing on original documents. These issues are of considerable concern and underscore the potential value of any and all data and the impossibility of predicting what dental information will be recovered and available after a person's death.

In the final analysis, all original documents, radiographs, photographs, appliances and casts, along with any associated materiel that records the dental status of a missing person during their lifetime, are crucial to successful identification of human remains. ♦

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### Further Reading

- Morlang WM. Dentistry's vital role in disaster preparedness. *J Calif Dent Assoc* 1996; 24(5):63-6.
- Pretty IA, Sweet D. A look at forensic dentistry – Part 1: The role of teeth in the determination of human identity. *Br Dent J* 2001; 190(7):359-66.
- Rothwell BR, Haglund W, Morton TH. Dental identification in serial homicides: the Green River Murders. *J Am Dent Assoc* 1989; 119(3):373-9.
- Sweet D, DiZinno JA. Personal identification through dental evidence — tooth fragments to DNA. *J Calif Dent Assoc* 1996; 24(5):35-42.

Dr. Sweet's full-day session at the joint ODA/CDA meeting, titled "One dentist's role in helping to solve murders in Canada!" will be presented on Friday, April 11.