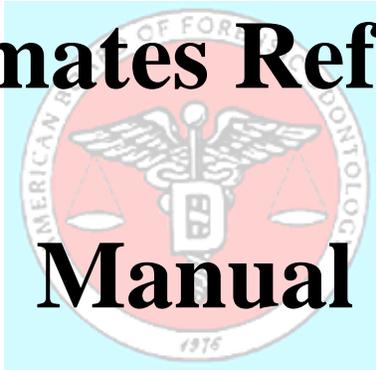


American Board of Forensic Odontology

Diplomates Reference Manual



March 2017 Edition

American Board of Forensic Odontology, Inc.

DIPLOMATES REFERENCE MANUAL

TABLE of CONTENTS

SECTION I

PREFACE

ACKNOWLEDGMENTS

BACKGROUND, FUNCTION & PURPOSES

A BRIEF HISTORY

ARTICLES OF INCORPORATION

REGISTRATION DOCUMENTATION

HISTORICAL LISTING OF ABFO OFFICERS:

SECTION II

BYLAWS

Section 1. Name.

Section 2. Location of Offices.

Section 3. Purposes

Section 4. Sponsors



ARTICLE I: MEMBERSHIP AND CERTIFICATION

Section 1. Eligibility for Membership.

Section 2. Qualifications for Membership

Section 3. Classes of Members.

Section 4. Certification

Section 5. Eligibility to Hold Office

Section 6. Fee Obligations

Section 7. Binding Arbitration.

ARTICLE II: CODE OF ETHICS AND CONDUCT

Section 1. The Code.

Section 2. Guiding Principles.

Section 3. Grounds for Discipline.

Section 4. Investigative Body.

Section 5. Investigation Initiating Action.

Section 6. Judiciary Process.

Section 7. Confidentiality, Rules, and AAFS Ethics.

ARTICLE III: MEETINGS

Section 1. Annual Meetings of the Board of Directors.

Section 2. Special meetings of the Board of Directors.

Section 3. Conduct of Board of Directors Business.

Section 4. The Diplomates Annual Meeting.

Section 5. Territory.

Section 6. Quorum.

ARTICLE IV: OFFICERS AND MANAGEMENT

Section 1. Board of Directors.

Section 2. Officers.

Section 3. Executive Committee.

Section 4. Nominating Committee.

Section 5. Elections.

ARTICLE V: COMMITTEES

Section 1. Special Committees.

Section 2. Standing Committees for Administrative Purposes.

Section 3. Standing Committees for Standards, Methods and Procedures.

Section 4. Certification and Examination Committee.

Section 5. Ethics Committee.

Section 6. Strategic Planning Committee

Section 7.

Section 8.

ARTICLE VI: FUNDS AND EXPENDITURES

Section 1. Income and Expenditures.

Section 2. Bi-annual Audit.

Section 3. Fiscal Year.

Section 4. Indemnity, Surety, and Fidelity.

Section 5. Compensation and Reimbursement.

ARTICLE VII: MISCELLANEOUS PROVISIONS

Section 1. Definitions.

Section 2. Seal and Insignia.

Section 3. Parliamentary Authority.

ARTICLE VIII: AMENDMENTS

Section 1. Repeal or Amendment of Previous Bylaws.

Section 2. Amendment Procedures.

SECTION III

POLICIES PROCEDURES STANDARDS AND GUIDELINES

ADMINISTRATIVE INFORMATION

Nominating Committee

Duties and Responsibilities of Directors and Officers

Fees

Travel Policy

Application Protocol for ABFO Research Funding

Research Funding for ABFO

Certification and Examination Information and Committee

Qualifications and Requirements for Certification

General Qualifications

Professional Education and Experience

Attaining Status of Examination Eligible

Procedure for Application

Examination Process

General Provisions Concerning Certification

ABFO Code of Ethics Form for Notarization

Recertification Program

Policy on Continuing Forensic Dental Education

ABFO Workshops

ABFO Workshop Policy

ABFO Repositories for Bitemark and Dental Age Estimation cases

Scientific Methodology Review

Definitions of Guidelines/Standards and Policies

Guideline, Standards and Policies Revisions Protocol

Bitemark Methodology, Standards and Guidelines

Methods to Document Human Bitemark Evidence

Human Bitemark Analysis Guidelines

ABFO Bitemark Terminology Guidelines

Terms Indicating an Injury is a Bitemark

Terms Used to Relate a Questioned Dentition to a Bitemark

Bitemark Case Review Guideline

Bitemark Decision Tree

ABFO Guidelines for Investigative and Final Bitemark Reports

ABFO Body Identification Information

Body Identification Guidelines

Collection and Preservation of Postmortem Dental Evidence

- [Comparison of Antemortem and Postmortem Evidence](#)
- [Categories and Terminology for Body Identification](#)
- [ABFO STANDARDS & GUIDELINES for DENTAL AGE ASSESSMENT](#)
 - [Purpose and Value](#)
 - [General Principles](#)
 - [Definitions](#)
 - [Standards](#)
 - [Guidelines](#)
 - [Dental Age Assessment Reports](#)
 - [Summary](#)
 - [Resources](#)
- [ID Appendices](#)
 - [Sources for Antemortem Data](#)
 - [Other Sources](#)
- [Dental Information in Missing / and Unidentified Persons Cases](#)
 - [Purpose](#)
 - [Missing Person Cases](#)
 - [The Missing Person Report](#)
 - [Gathering of Dental Information](#)
 - [Using the Dental Information](#)
 - [Unidentified Body Cases](#)
 - [The Unidentified Body Report](#)
 - [Gathering the Dental Information](#)
 - [Preserving the Dental Information](#)
 - [Using the Dental Information](#)
 - [Search and Comparison Programs](#)
- [WinID: History and Development](#)
- [Mass Fatality Incident Guidelines: Development of a Dental Identification Team](#)
 - [Purpose](#)
 - [Team Development](#)
 - [Outline of Team Organization](#)
 - [Additional Resources](#)
 - [Checklist of Supply and Equipment Requirements](#)
- [Dental School Curriculum Guidelines for Forensic Odontology](#)
 - [Preamble](#)
 - [Introduction](#)
 - [Recommended Core Content](#)
- [ABFO OFFICERS](#)
- [ABFO BOARD OF DIRECTORS](#)
- [ABFO COMMITTEES](#)
- [ABFO AWARDS](#)

DIPLOMATES REFERENCE MANUAL

SECTION I

Preface, Acknowledgments, Background, Functions and Purposes

PREFACE

In 1988, a project to compile all relevant material relating to the past and present activities and business of the American Board of Forensic Odontology was initiated. After four years the resultant *Diplomates Reference Manual* was completed and provided to all diplomates in a printed form. During the years following this initial publication additional information has been added and the Manual updated yearly to reflect the changes and new business of the ABFO. Because of current technology the updating and dissemination of the *Diplomates Reference Manual* is now done via the ABFO website.

This manual is being provided to all diplomates of the American Board of Forensic Odontology and other interested parties at the ABFO website at www.abfo.org. It is recommended that ABFO diplomates become familiar with all of the sections of this publication as much of the information contained herein is important for not only our forensic case work but for the growth and development of our science and the continued effectiveness of the ABFO.

Section I:

Preface, Acknowledgments, Background, and Functions & Purposes of the ABFO.

Section II:

Contains the Bylaws, Code of Ethics, Articles of Incorporation and historical list of the past officers of the ABFO.

Section III:

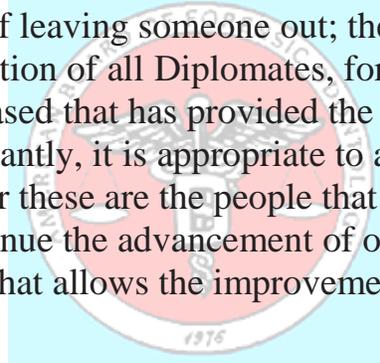
Contains the Policies, Procedures, Guidelines and Standards that have been established over the years. Some of this information has to do with the procedures that you must follow to maintain your diplomate status and policies that must be adhered to if you are conducting ABFO business.

The Guidelines in this document represent work by many individuals and have been accepted by the Diplomates of the ABFO.

These are copyrighted materials and can be used freely by the diplomates of the ABFO but permission to publish these guidelines in other publications should be obtained by request to the Executive Committee and/or the Board of Directors of the ABFO. Diplomates should review these Guidelines and Standards frequently and strive to follow them as much as possible and encourage others to do the same. With continuing research and technological advancements it will be necessary to modify and/ or add to these existing Guidelines.

ACKNOWLEDGMENTS

The American Board of Forensic Odontology acknowledges those individuals that have contributed to the information that is contained in this manual. It is difficult to list names without the risk of leaving someone out; therefore, it seems appropriate to acknowledge the contribution of all Diplomates, for it is the input of all Diplomates active and deceased that has provided the information that is contained in this Manual. More importantly, it is appropriate to acknowledge the families and friends of the Diplomates for these are the people that also sacrifice their time with us and encourage us to continue the advancement of our profession. It is our dedication as well as theirs that allows the improvement of our science.



BACKGROUND, FUNCTIONS & PURPOSES

The need to identify forensic scientists qualified to provide essential professional services for the judicial and executive branches of government has long been recognized. In response to this professional mandate, the American Board of Forensic Odontology was organized in 1976 to provide, in the interest of the public and the advancement of the science, a program of certification in forensic odontology.

In purpose, function, and organization, the AMERICAN BOARD OF FORENSIC ODONTOLOGY, Inc., herein after referred to as ABFO, is thus analogous to the certifying Boards in various medical specialties and various medical specialties and scientific fields. The objective of the Board is to establish, enhance, and revise as necessary, standards of qualification for those who practice forensic odontology, and to certify as qualified specialists those applicants who comply with the requirements of the Board.

Certification is based upon the candidate's personal and professional record of education, training, experience and achievement, as well as the results of a formal examination. The ABFO is an incorporated non-profit organization. The ABFO is recognized by the American Academy of Forensic Sciences and is accredited by the Forensic Specialties Accreditation Board (FSAB) www.thefsab.org . The current [Certificate of Accreditation](#) from the FSAB is within this document.

A BRIEF HISTORY

The American Academy of Forensic Sciences (AAFS) was founded in 1948 and served as the parent organization of the American Board of Forensic Odontology (ABFO). The early composition of the Academy consisted of the Jurisprudence, Pathology & Biology, Psychiatry, Questioned Documents, and Toxicology sections. Before 1970, the few dentist members of the AAFS were first assigned to the Pathology & Biology section and later to the General section. The Odontology section was added in 1970 at the recommendation of Academy officers and the required numbers of dentists were recruited from the General section.

In 1962, the Armed Forces Institute of Pathology (AFIP) began to include forensic odontology in its list of course offerings with dental lectures and laboratory sessions presented by several oral pathologists and one of ABFO's charter members, Dr. David Scott. Background presentations on forensic pathology, toxicology, and the law were also given by various experts in those disciplines, as well. The course content and emphasis began to change when identification procedures at disaster sites were evaluated by the Federal Aviation Administration (FAA). There was a pressing need to establish an accepted protocol for these situations and to teach these protocols to interested and involved individuals. Many dentists who participated in this early effort with the AFIP were charter members of the ABFO.

Colonel Robert Boyers, Chief of Oral Pathology at the AFIP, was very influential in the creation of the American Society of Forensic Odontology (ASFO) in 1970. He was concerned that many individuals interested in this field but not actively engaged in the practice of forensic dentistry through a formal affiliation with some forensic agency, could not become members of the Odontology section of the Academy. The ASFO was founded to allow anyone interested in forensic odontology to meet and further their knowledge in this area. Today, it is an important organization serving forensic odontology through its educational programs and publications available to all.

In the mid-seventies, the potential role of dental evidence in personal identification and Criminalistics was being recognized by police agencies and the courts. The National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, United States Department of Justice gave grants to the Forensic Sciences Foundation, Inc., in 1973, to establish certifying boards in various forensic disciplines, including forensic odontology. These boards were to be established in order to identify and certify experts in their respective fields. As a result, in 1976, with the initial sponsorship of AAFS and the encouragement and assistance of the National Association of Medical Examiners (NAME), the American Board of Forensic Odontology (ABFO) was formed.

The charter members of the ABFO were Doctors Edward Woolridge, Richard Souviron, Curtis Mertz, Arthur Goldman, Gerald Vale, Stanley Schwartz, Lowell Levine, Robert Dorion, Paul Stimson, David Scott, Manuel Maslansky, and George Ward. These charter members made the decision not to be “grandfathered” into the organization. Instead, they took the time and effort to meet the required personal criteria on education, experience, and forensic cases and take the certifying examination that had been established. Thus, these charter members became the first diplomates of the ABFO.

The charter members were very active in establishing important professional and public relations through their leadership in many dental fields: private practice, organized dentistry, dental education and research, specialty practice, military dentistry, and so on. Their contributions were invaluable in helping to build a sound foundation for organized forensic odontology.

Dr. Curtis Mertz served as the ABFO’s first president from 1976 until 1978 and was very influential in establishing the direction of the Board would take during the early years.

While the primary function of the ABFO as a certification (and re-certification) body remains paramount, the Board has long recognized an ongoing need for continuing education and research, promotion of public and professional relations, and enhancement of its commitment to the law and to the public. To this end, the first major effort to develop guidelines for scientific analysis of bite mark evidence was undertaken in a 1984 workshop.

Over the ensuing years, it became clear that other aspects of forensic odontology should be addressed, given the broad scope of the discipline. In the early 1990’s, the Board became more active in establishing guidelines and setting standards for these various areas. The Board was restructured to include (in addition to the administrative committees) five standing committees for Standards, Methods and Procedures: a) Civil Litigation, b) Bite mark and Pattern Injury, c) Human Abuse and Neglect, d) Mass Disaster, and e) Missing and Unidentified Persons.

In general, the duties of these committees were to “...encourage the study of, improve the practice of, enhance the standards for and advance the specialty areas of forensic odontology”, (Article V, Section 3, ABFO Bylaws and Code of Ethics). Specifically, these committees were directed to establish guidelines and set standards for their respective areas and to educate the membership and the forensic community at large, on the specifics of these guidelines and standards. With these objectives in mind, additional workshops in bite marks, body identification, human abuse and neglect, and developing a disaster dental identification team have all taken place since that time. Further, the ABFO and the Council of Dental Practice of the American Dental Association sponsored the first and second National Symposia on Dentistry’s Role and Responsibility in Mass Disasters, held in Chicago in 1986 and 1996.

*American Board of Forensic Odontology, Inc.
Diplomates Reference Manual
Section I: Preface, Acknowledgments, Background, Functions & Purposes*

The governing body of the ABFO consists of the officers and directors who collectively comprise the Board of Directors. Officers and directors are elected by the general membership at the annual meeting. Annual meetings and workshops are typically held in conjunction with the AAFS and ASFO meetings which occur during February at a site designated by the AAFS.



ARTICLES OF INCORPORATION

(A Nevada Nonprofit Corporation)
NRS Chapter 82 Et. Seq.

The undersigned, acting as incorporator of a Corporation under NRS Chapter 82 of the Nevada Revised Statutes, adopts the following Articles of Incorporation for such Corporation:

FIRST: The name of the Corporation is: American Board of Forensic Odontology, Inc.; hereinafter referred to as the "Corporation".

SECOND: The period of its duration is perpetual.

THIRD: The Corporation's initial registered agent shall be Robert C. Anderson. The registered office of the corporation in the State of Nevada is 245 East Liberty Street, Third Floor, Reno, Nevada 89501.

FOURTH: The Corporation is a nonprofit Corporation.

FIFTH: This Corporation is organized exclusively for charitable, religious, educational and scientific purposes, and its object and purposes in the public interest shall be: To encourage the study of, improve the practice of, establish and enhance standards for, and advance the science of forensic odontology. To encourage and promote adherence to high standards of ethics, conduct, and professional practice by forensic odontologists. To grant and issue certificates, or other recognition, in cognizance of special qualifications in forensic odontology to voluntary applicants who conform to the standards established by the Board, and who, in accordance with the Bylaws and Rules and Regulations of the Board, have established their fitness and competence therefore. To establish, maintain, alter, amend, and repeal rules and regulations, standards, qualifications, and requirements for the granting, issuing and renewal of certification or other recognition. To exercise and enjoy all powers, rights, and privileges granted to, or conferred upon, corporations of similar character by the laws of the State of Nevada now or hereafter in force. To do any or all of the things herein set forth as principal, agent or otherwise, alone or in company with others. The objects and purposes specified herein shall be regarded as independent objects and purposes and, except where otherwise expressed, shall in no way be limited or restricted by reference to, or inference from, the terms of any other provision of this Articles of Incorporation. The foregoing shall be construed both as objects and powers and the enumeration thereof shall not be held to limit or restrict in any manner the general powers conferred on the corporation by the laws of the State of Nevada.

SIXTH: The Corporation is not organized for pecuniary profit and shall not have authority to issue capital stock. No part of the net earnings of the corporation shall inure to the benefit of, or be distributed to its trustees, directors, officers, delegates, members or other private persons, except that the corporation shall be authorized and empowered to pay reasonable compensation for services rendered and to make payments and distributions in furtherance of the purposes set forth in ARTICLE FIFTH, hereof. Notwithstanding any other provision of these Articles, the corporation shall not carry on any activities not permitted to be carried on by a corporation

American Board of Forensic Odontology, Inc.
Diplomates Reference Manual
Section I: Preface, Acknowledgments, Background, Functions & Purposes

exempt from Federal income tax under Section 501 (c) (3) of the Internal Revenue Code of 1986, or the corresponding provision of any future United States Internal Revenue Law.

SEVENTH: The members of the governing Board of the corporation shall be styled "Directors", and the first Board of Directors of the corporation shall consist of at least seven (7) and not more than fifteen (15) persons and shall be vested with the management and control of the property, business and affairs of the corporation. The initial Board of Directors, who shall number fourteen (14), shall serve until the end of the corporation's fiscal year next following the first annual meeting of the Directors or until their successors have been duly elected and qualified. Thereafter, the members of the Board of Directors shall be elected by the Diplomates, in accordance with the Bylaws, from lists of nominees supplied by one or more nominating organizations, or from among other eligible persons. The Board of Directors shall have the power to adopt, alter, amend, and repeal such bylaws of the corporation as will not conflict with this Articles of Incorporation, for the regulation and management of the affairs of the Corporation. The Corporation may in its Bylaws confer other powers upon the Directors, in addition to the powers and authorities expressly conferred upon them by law and these Articles of Incorporation.

EIGHTH: The initial Board of Directors shall number fourteen (14) and shall consist of the following persons listed by name, and address, who are to serve until the end of the corporation's fiscal year next following the first annual meeting of the Directors, or until their successors have been duly elected and qualified:

NAME ADDRESS:

1. Dr. David C. Averill 239 Pearl Street
Burlington, VT 05401
2. Dr. James B. McGivney 66 Grasso Plaza
St. Louis, MO 63123
3. Dr. Robert E. Barsley 1100 Florida Avenue, Box 140
New Orleans, LA 70119
4. Dr. Harry H. Mincer UT Center for Health Sciences
800 Madison Avenue
Memphis, TN 38163
5. Dr. Mark L. Bernstein U of L, School of Dentistry
Louisville, KY 40292

6. Dr. Ann L. Norrlander 825 Nicollet Mall, Suite 1553
Minneapolis, MN 55402
7. Dr. Gregory S. Golden 77 East 7th Street, Suite B
Upland, CA 91786
8. Dr. Phillip E. O'Shaughnessy 4626 West Jefferson Boulevard
Fort Wayne, IN 46804
9. Dr. Peter F. Hampl 1901 South Cedar, Suite 106
Tacoma, WA 98405
10. Dr. Neal Riesner 50 Popham Road
Scarsdale, NY 10583
11. Dr. George M. Isaac 615 E. Schuster, Bldg. 9B

American Board of Forensic Odontology, Inc.
Diplomates Reference Manual
Section I: Preface, Acknowledgments, Background, Functions & Purposes

- El Paso, TX 79902
12. Dr. Gerald L. Vale 1200 N. State Street, OPD 1P55
Los Angeles, CA 90033
13. Dr. John P. Kenney 101 South Washington Street
Park Ridge, IL 60068
14. Dr. Allan J. Warnick 31632 Schoolcraft Road
Livonia, MI 48150

NINTH: The Corporation shall have members distinct from the Board of Directors, who shall be styled as "Diplomates", the terms and qualifications of which are set forth in the Bylaws of the Corporation.

TENTH: No Director or Officer of the Corporation shall be liable to the Corporation or its members for damages for breach of fiduciary duty as a Director or officer excepting only (a) acts or omissions which involve intentional misconduct, fraud or a knowing violation of law, (b) the payment of distributions in violation of NRS 82.136, or (c) an action or proceeding brought pursuant to NRS 82.136 or Chapter 35 of NRS. Except as otherwise provided in NRS 82.536, 82.136 and Chapter 35 of NRS, no action may be brought against an Officer or Director of a Corporation based on any act or omission arising from failure in his official capacity to exercise due care regarding the management or operation of the Corporation unless the act or omission involves intentional misconduct, fraud, knowing violation of the law or the failure of a Director or Officer of a corporation for public benefit to review information, opinions, reports, books of account or statements, including financial statements or other financial information, to him for review. No amendment or repeal of this Article applies to, or has any effect on, the liability, or alleged liability, of any Director or Officer of this Corporation for, or with respect to, any acts or omissions of the Director or Officer occurring prior to the amendment or repeal, except as otherwise required by law.

ELEVENTH: The territory in which the operations of the Corporation are to be conducted is the United States of America and its territories and possessions, and in such other places as the Board of Directors may from time to time authorize and direct. Meetings of the Board of Directors and committees may be held within or without the State of Nevada. Subject to any provision contained in the applicable statutes, the Corporation may have an office or offices and keep its books within or without the State of Nevada at such place or places as may from time to time be designated by the Directors or in the Bylaws of the corporation.

TWELFTH: In the event of and upon the dissolution of the corporation, the Board of Directors shall, after paying or making provisions for the payment of all of the liabilities of the Corporation, dispose of all of the assets of the Corporation exclusively for the purpose of the corporation in such manner, or to such organization or organizations organized and operated exclusively for charitable, educational, religious or scientific purposes as shall at the time qualify as an exempt organization or organizations under Section 501 (c) (3) of the Internal Revenue Code of 1986, as the Board of Directors shall determine.

THIRTEENTH: The Corporation shall have and may exercise all of the corporate powers enumerated in NRS Chapter 82 et seq., as amended, provided that none of the assets, funds or

American Board of Forensic Odontology, Inc.
Diplomates Reference Manual
Section I: Preface, Acknowledgments, Background, Functions & Purposes

income of the Corporation shall inure to the benefit of any private individual, and no substantial part of the activities of the Corporation shall consist of carrying on propaganda or otherwise attempting to influence legislation, and the Corporation shall not participate in, or intervene in (including by the publishing or distributing of statements), any political campaign on behalf of any candidate for public office, and further provided that the Corporation may do any and all things necessary or advisable for, or incident to, carrying out the aforesaid purposes of the Corporation, but shall not otherwise engage in activities which in themselves, are not in furtherance of one or more exempt purposes except as the same do not represent a substantial part of its activities. To protect the tax-exempt status of the corporation, the following provisions shall apply:

- (a) The Corporation shall distribute its income for each taxable year at such time and in such manner as not to become subject to the tax on undistributed income imposed by Section 4942 of the Internal Revenue Code of 1986, or corresponding provisions of any subsequent federal tax law.
- (b) The Corporation shall not engage in any act of self-dealing as defined in Section 4941 (d) of the Internal Revenue Code of 1986 or corresponding provisions of any subsequent federal tax law.
- (c) The Corporation shall not retain any excess business holdings as defined in Section 4943 (c) of the Internal Revenue Code of 1986, or corresponding provisions of any subsequent federal tax law.
- (d) The Corporation shall not make any investments in such manner as to subject it to tax under Section 4944 of the Internal Revenue Code of 1986, or corresponding provisions of the subsequent federal tax laws.
- (e) The Corporation will not make any taxable expenditure as defined in Section 4945 (d) of the Internal Revenue Code of 1986, or corresponding provisions of any subsequent federal tax law.

FOURTEENTH: Every person who was or is a party or is threatened to be made a party to or is involved in any action, suit or proceedings, whether civil, criminal, administrative or investigative, by reason of the fact that he or a person for whom he is the legal representative is or was an Officer or Director of the Corporation or is or was serving at the request of the Corporation as an Officer or Director of another corporation, or as its representative in a partnership, joint venture, trust or other enterprise, shall be indemnified and held harmless to the fullest extent legally permissible under the law of the State of Nevada from time to time against all expenses, liability and loss (including attorney's fees, judgments, fines and amounts paid or to be paid in settlement) reasonably incurred or suffered by him in connection therewith. Such right of indemnification shall be a contract right which may be enforced in any manner desired by such person. Such right of indemnification shall not be exclusive of any other right which such Directors, Officers or representatives may have or hereafter acquire and, without limiting the generality of such statement, they shall be entitled to their respective rights of indemnification under any Bylaw, agreement, vote of Shareholders, provision of law or otherwise, as well as their rights under this Article. Without limiting the application of the foregoing, the Board of Directors may adopt Bylaws from time to time with respect to indemnification to provide at all times the fullest indemnification permitted by the law of the State of Nevada and may cause the Corporation to purchase and maintain insurance on behalf of any person who is or was an Officer or Director of the Corporation, or is or was serving at the request of the Corporation as an Officer or Director of another corporation, or as its representative in a partnership, joint venture,

*American Board of Forensic Odontology, Inc.
Diplomates Reference Manual
Section I: Preface, Acknowledgments, Background, Functions & Purposes*

trust or other enterprise against any liability asserted against such person and incurred in any such capacity or arising out of such status, whether or not the Corporation would have the power to indemnify such person.

FIFTEENTH: The Bylaws of the Corporation are to be made and adopted by the Board of Directors and may be amended or rescinded by a majority vote of the Board.

SIXTEENTH: This Articles of Incorporation may be amended upon adoption of Articles of Amendment to the Articles of Incorporation by a majority of the Board of Directors.

SEVENTEENTH: The names of the incorporator and the incorporator's address are:

Dr. David Sipes
Vienna Medical Clinic
135 Center Street, South
Vienna, VA 22180

IN WITNESS WHEREOF, I have executed these Articles of Incorporation.

Dr. David Sipes

(Notarized October 7, 1991)

(Filed with the State of Nevada on November 21, 1991)



REGISTRATION DOCUMENTATION



State of Missouri

Trade Marks and Service Marks:
Application or Renewal

1. Applicant's name American Board of Forensic Odontology
Street address 615 E. Schuster Ave ~~100~~ Bid 9B
City, state, zip EL PASO, TX 79902 13956
If applicant is a corporation, give state of incorporation NEVADA

2. Applicant is seeking to register
 Trade mark Service mark
3. If renewal, give date of expiration _____
4. What is the number and class of goods and services connected with mark: 41; education

FILED
MAY 6 1997
Rebecca McDowell Cook
SECRETARY OF STATE
Do not write in this space

5. Briefly describe the goods and services used in connection with the mark:
PROFESSIONAL Certification of dentists
Note the Full Name, Abbreviation ABFO + logo are used
6. Briefly describe how the mark is used in connection with such goods and services:
Advertising, letterhead, used in scientific literature. Plea.
7. The mark has been used in business by the applicant (or predecessor) since 1970 and used in the state of Missouri since 1984
8. Give a written description of the mark education and certification of dentists bestowed by the organization called "ABFO", "American Board of Forensic Odontology" +/or logo
9. The applicant is the owner of the trade mark or service mark described in the application, and no other person has the right to use such mark in Missouri either in identical form or in such near resemblance as might be calculated to deceive or be mistaken for original mark.
1. George M. ISAAC, being first duly sworn, state that I am the applicant, or a lawfully authorized representative of the applicant, that I have read the above application and know its contents and that the facts stated therein are true.

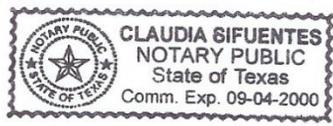
George M. Isaac Signature President Title

State of Texas }
County of El Paso } ss
Subscribed and sworn to before me this 18th day of April, 1997.

Claudia Sifuentes
Notary Public

(Seal)

My appointment or commission expires: _____





STATE OF MISSOURI
Office of
Secretary of State

RENEWAL OF CERTIFICATE OF REGISTRATION

I, ROBIN CARNAHAN, Secretary of State of the State of Missouri, and Keeper of the Great Seal thereof, hereby certify that the Service mark, registration number #S13956 for

organization called "ABFO", "American Board of Forensic Odontology"
+/or logo

being used in connection with Class 41 for Education and entertainment having been filed by **American Board of Forensic Odontology** on May 6, 1997, and first used in Missouri in 1984 has this day been renewed by

American Board of Forensic Odontology, Inc.
11 Ronnies Plaza
St. Louis, MO 63126

A copy of said mark is hereto attached and has been duly recorded in this office in conformity with Section 417.026 RSMo. 2000. Said mark is renewed for a period of ten years and will expire on May 5, 2017.

IN TESTIMONY WHEREOF, I hereunto set my hand and cause to be affixed the GREAT SEAL of the State of Missouri. Done at the City of Jefferson, this 8th day of June, 2007.



Comm. 15A (01-2005)

Robin Carnahan
Secretary of State

06/2007

**FORENSIC SPECIALTIES ACCREDITATION BOARD
CERTIFICATE OF ACCREDITATION**

March 2013 – March 2018

FORENSIC SPECIALTIES ACCREDITATION BOARD

The Forensic Specialties Accreditation Board, Inc. hereby declares that the

American Board of Forensic Odontology

has fulfilled all requirements and has met all standards for accreditation and therefore grants this

Certificate of Accreditation

Effective this first day of March 2013 for a period of five years

Derek L. Hammond

Derek L. Hammond, B.A., D-ABFDE
President

David R. Senn

David R. Senn, DDS, D-ABFO
Secretary



Certificate Number 007

HISTORICAL LISTING OF ABFO OFFICERS

1976

President - Dr. Curtis Mertz
Vice President - Dr. Thomas Ward
Secretary - Dr. Paul Stimson
Treasurer - Dr. Manuel Maslansky

1977

President - Dr. Curtis Mertz
Vice President - Dr. Thomas Ward
Secretary - Dr. Paul Stimson
Treasurer - Dr. Manuel Maslansky

1978

President - Dr. Curtis Mertz
Vice President - Dr. Thomas Ward
Secretary - Dr. Homer Campbell
Treasurer - Dr. Arthur Goldman

1979

President - Dr. Arthur Goldman
Vice President - Dr. Edward Woolridge
Secretary - Dr. Homer Campbell
Treasurer - Dr. William Giles



1980

President - Dr. Arthur Goldman
Vice President - Dr. Norman Sperber
Secretary - Dr. Homer Campbell
Treasurer - Dr. William Giles

1981

President - Dr. Lowell Levine
Vice President - Dr. Norman Sperber
Secretary - Dr. Homer Campbell
Treasurer - Dr. William Giles

1982

President - Dr. William Giles
Vice President - Dr. Gerald Vale
Secretary - Dr. Homer Campbell
Treasurer - Dr. David Sipes

HISTORICAL LISTING OF ABFO OFFICERS: Continued

1983

President - Dr. Gerald Vale
Vice President - Dr. Thomas Krauss
Secretary - Dr. Homer Campbell
Treasurer - Dr. David Sipes

1984

President - Dr. David Scott
Vice President - Dr. David Sipes
Secretary - Dr. Raymond Rawson
Treasurer - Dr. William Alexander

1985

President - Dr. Robert Dorion
Vice President - Dr. Miles Standish
Secretary - Dr. Richard Souviron
Treasurer - Dr. Edward Herschaft

1986

President - Dr. Raymond Rawson
Vice President - Dr. William Alexander
Secretary - Dr. David Sipes
Treasurer - Dr. Paul Stimson



1987

President - Dr. Richard Souviron
President Elect - Dr. Thomas Krauss
Vice President - Dr. Edward Herschaft
Secretary - Dr. David Sipes
Treasurer - Dr. Paul Stimson

1988

President - Dr. Thomas Krauss
President Elect - Dr. Stanley Schwartz
Vice President - Dr. David Sipes
Secretary - Dr. Wilbur Richie
Treasurer - Dr. Paul Stimson

HISTORICAL LISTING OF ABFO OFFICERS: Continued

1989

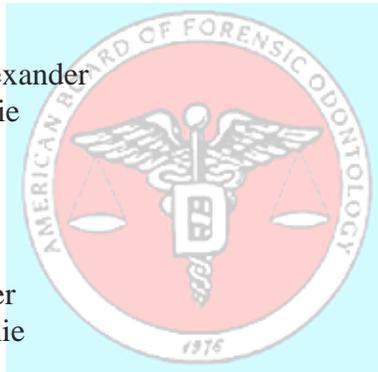
President - Dr. Stanley Schwartz
President Elect- Dr. David Sipes
Vice President - Dr. Paul Stimson
Secretary - Dr. Wilbur Richie
Treasurer - Dr. Gary Bell

1990

President - Dr. David Sipes
President Elect - Dr. Paul Stimson
Vice President - Dr. William Alexander
Secretary - Dr. Gary Bell
Treasurer - Dr. Wilbur Richie

1991

President - Dr. Paul Stimson
President Elect - Dr. William Alexander
Vice President - Dr. Wilbur Richie
Secretary - Dr. Gary Bell
Treasurer - Dr. John Kenney



1992

President - Dr. William Alexander
President Elect - Dr. Wilbur Richie
Vice President - Dr. Gary Bell
Secretary - Dr. Ann Norrlander
Treasurer - Dr. John Kenney

1993

President - Dr. Wilbur Richie
President Elect - Dr. Gary Bell
Vice President - Dr. John Kenney
Secretary - Dr. Ann Norrlander
Treasurer - Dr. George Isaac

1994

President - Dr. Gary Bell
President Elect - Dr. Jack Kenney
Vice President - Dr. Ann Norrlander
Secretary - Dr. David Averill
Treasurer - Dr. George Isaac

HISTORICAL LISTING OF ABFO OFFICERS: Continued

1995

President - Dr. Jack Kenney
President Elect - Dr. Ann Norrlander
Vice President - Dr. George Isaac
Secretary - Dr. David Averill
Treasurer - Dr. Harry Mincer

1996

President - Dr. Ann Norrlander
President Elect - Dr. George Isaac
Vice President - Dr. David Averill
Secretary - Dr. L. Thomas Johnson
Treasurer - Dr. Harry Mincer

1997

President - Dr. George Isaac
President Elect - Dr. David Averill
Vice President - Dr. Harry Mincer
Secretary - Dr. L. Thomas Johnson
Treasurer - Dr. Michael Tabor



1998

President - Dr. David Averill
President Elect - Dr. Harry Mincer
Vice President - Dr. L. Thomas Johnson
Secretary - Dr. Joseph Gentile
Treasurer - Dr. Michael Tabor

1999

President - Dr. Harry Mincer
President Elect - Dr. L. Thomas Johnson
Vice President - Dr. Michael Tabor
Secretary - Dr. Joseph Gentile
Treasurer - Dr. Bryan Chrz

2000

President - Dr. L. Thomas Johnson
President Elect - Dr. Michael Tabor
Vice President - Dr. Joseph Gentile
Secretary - Dr. John Lewis
Treasurer - Dr. Bryan Chrz

HISTORICAL LISTING OF ABFO OFFICERS: Continued

2001

President - Dr. Michael Tabor
President Elect - Dr. Joseph Gentile
Vice President - Dr. Bryan Chrz
Secretary - Dr. John Lewis
Treasurer - Dr. James McGivney

2002

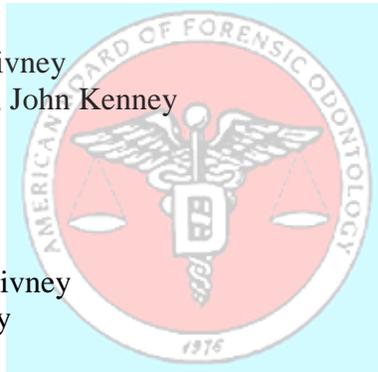
President - Dr. Joseph Gentile
President Elect - Dr. Bryan Chrz
Vice President - Dr. John Lewis
Secretary - Dr. Curtis Hansford
Treasurer - Dr. James McGivney

2003

President – Dr. Bryan Chrz
President Elect – Dr. John Lewis
Vice President – Dr. James McGivney
Secretary – Drs. Curtis Hansford, John Kenney
Treasurer – Dr. Richard Dial

2004

President – Dr. John Lewis
President Elect – Dr. James McGivney
Vice President – Dr. John Kenney
Secretary – Dr. Peter Hampl
Treasurer – Dr. Richard Dial



2005

President – Dr. James McGivney
President Elect – Dr. John Kenney
Vice President – Dr. Richard Dial
Secretary – Dr. Peter Hampl
Treasurer – Dr. David Senn

2006

President - Dr. John Kenney
President Elect - Dr. Richard Dial
Vice President - Dr. Peter Hampl
Secretary – Dr. Franklin Wright
Treasurer – Dr. David Senn

HISTORICAL LISTING OF ABFO OFFICERS: continued

2007

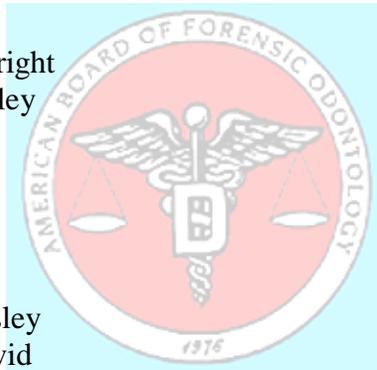
President-Dr. Richard Dial
President Elect- Dr. Peter Hampl
Vice President- Dr. David Senn
Secretary- Dr. Franklin Wright
Treasurer- Dr. Robert Barsley

2008

President – Dr. Peter Hampl
President Elect – Dr. David Senn
Vice President – Dr. Franklin Wright
Secretary – Dr. Thomas David
Treasurer – Dr. Robert Barsley

2009

President – Dr. David Senn
President Elect – Dr. Franklin Wright
Vice President – Dr. Robert Barsley
Secretary – Dr. Thomas David
Treasurer – Dr. Gregory Golden



2010

President – Dr. Franklin Wright
President Elect – Dr. Robert Barsley
Vice President – Dr. Thomas David
Treasurer – Dr. Gregory Golden
Secretary – Dr. Peter Loomis

2011

President – Dr. Robert Barsley
President Elect – Dr. Thomas David
Vice President – Dr. Gregory Golden
Treasurer – Dr. Gary Berman
Secretary – Dr. Peter Loomis

2012

President – Dr. Thomas David
President Elect – Dr. Gregory Golden
Vice President – Dr. Peter Loomis
Treasurer – Dr. Gary Berman
Secretary – Dr. Adam Freeman

*American Board of Forensic Odontology, Inc.
Diplomates Reference Manual
Section I: Preface, Acknowledgments, Background, Functions & Purposes*

2013

President – Dr. Gregory Golden
President Elect – Dr. Peter Loomis
Vice President – Dr. Gary Berman
Treasurer – Dr. Paula Brumit
Secretary – Dr. Adam Freeman

2014

President – Dr. Peter Loomis
President Elect – Dr. Gary Berman
Vice President – Dr. Adam Freeman
Treasurer – Dr. Paula Brumit
Secretary – Dr. Richard Weems

2015

President – Dr. Gary Berman
President Elect – Dr. Adam Freeman
Vice President – Dr. Paula Brumit
Treasurer – Dr. Holland Maness
Secretary – Dr. Richard Weems

2016

President – Dr. Adam Freeman
President Elect – Dr. Paula Brumit
Vice President – Dr. Richard Weems
Treasurer – Dr. Holland Maness
Secretary – Dr. Scott Hahn



2017

President – Dr. Paula Brumit
President Elect – Dr. Richard Weems
Vice President – Dr. Ed Herschaft
Treasurer – Dr. Roger Metcalf
Secretary – Dr. Jim Lewis

SECTION II

Bylaws and Code of Ethics

BYLAWS

PREAMBLE

Section 1. Name.

The name of the organization is the American Board of Forensic Odontology, herein also referred to as the “Board” or the “ABFO”. It is incorporated as a nonprofit organization in the state of Nevada. The Board of Directors of this organization shall not be referred to as the “Board” as this term is reserved for the ABFO.

Section 2. Location of Offices.

The registered office of this corporation in the state of Nevada, is 5441 Kietzke Lane Reno, Nevada 89511. The registered agent is Eastbiz.com

The Board may have such other offices at such locations, within or without the state of Nevada, as the Board of Directors may, from time to time, designate.

Section 3. Purposes.

The purpose of the Board, in the public interest, shall be:

- a. To encourage the study of, improve the practice of, establish and enhance guidelines and standards for, and advance the specialty of forensic odontology.
- b. To encourage and promote adherence to high standards of ethics, conduct, and professional practice by forensic odontologists.
- c. To grant and issue certification certificates, and/or other recognition, in cognizance of special qualifications in forensic odontology, to voluntary applicants who conform to the standards established by the Board and who have established their fitness and competence therefore.
- d. To continue cooperation with branches of federal and state governments and appropriate governmental and private agencies and organizations, in order to maintain recognition and acceptance of the American Board of Forensic Odontology, Inc., as an acknowledged special qualification for the practice of forensic odontology.
- e. To maintain and, at the discretion of the Board of Directors, furnish lists of individuals who have been granted Certificates by the Board, hereinafter referred to as diplomates.

- f. To engage in any activities, not prohibited by law or the Board's Articles of Incorporation, which may contribute to the above purposes or which are in furtherance of the objects and purposes enumerated in the Articles.

Section 4. Sponsors.

- a. Sponsors. The Board of Directors may, by two-thirds (2/3) affirmative vote, invite organizations having a legitimate interest in forensic odontology to become sponsors of the Board.
- b. Termination of Sponsorship. A sponsoring organization may, at its discretion, terminate its sponsorship of the Board upon due notice to the Board. Such sponsorship may also be terminated by a two-thirds (2/3) affirmative vote of the Board of Directors.
- c. Responsibility of Sponsors. A sponsoring organization shall not have any obligation for financial support of the Board and shall not, by virtue of its sponsorship of the Board, have authority over or responsibility for any of the Board's operations, activities, or decisions. The principle role of a sponsoring organization is to endorse and support the objectives of the Board and to give recognition to the Board's activities and programs.



ARTICLE I: MEMBERSHIP AND CERTIFICATION

Section 1. Eligibility for Membership.

ABFO membership, in the various classifications subsequently prescribed, shall be available only to those persons of professional competence, integrity and good moral character:

- a.** who are actively engaged in the field of forensic odontology and who have made some significant contribution to the literature in the science, or
- b.** who have advanced the cause of forensic odontology in other significant manner, or
- c.** who are pursuing a career which has as its purpose, the attainment of either of the foregoing objectives (a) or (b), and
- d.** who have earned a doctoral degree in dentistry from an accredited college or university.

Section 2. Qualifications for Membership.

In accordance with these bylaws, qualifications for membership shall be established and reviewed annually by the Board of Directors.

Section 3. Classes of Members.

Active Diplomate

Retired Diplomate. An active Diplomate who wishes to retire may apply to the ABFO Board of Directors to be reclassified as a Retired Diplomate by filling out the Retired Diplomate Application. The application can be requested from the Secretary of the ABFO. The completed application must be received by the Secretary at least ninety days before the expiration of the applicant Diplomate's current certification period. Those diplomates who resigned between 2008 and 2013 will be given one year from the date of this amendment to apply for retired status.

To be considered for retired status the applicant must be a Diplomate in good standing, must not have outstanding dues or be the subject of a pending or active ethics complaint, and must affirm their intent to retire from active forensic odontology including forensic odontology casework and/or DVI team membership. A Retired Diplomate may participate in providing forensic odontology education including continuing education lectures and participate in ad hoc DVI.

The application will require approval from the ABFO BOD with a simple majority vote. Once granted "Retired" status Retired Diplomates may use the following designation following their name in printed or published media, "**D-ABFO, Retired**"

Retired Diplomates are not to be regarded as being "certified" or "board certified" by the ABFO.

Retired Diplomates may attend ABFO meetings, will receive ABFO emails, and will be granted access to the member's only section of the ABFO website. Retired Diplomates are excused from recertification and the payment of annual dues.

Retired diplomates **shall not**, have the right to vote, hold office, or be counted in the determination of a quorum for the transaction of ABFO business. The President may accord the privilege of the floor to Retired Diplomates to speak on specific matters.

A Retired Diplomat who wishes to be reinstated as an active Diplomat must reapply to the ABFO and fulfill all current requirements for new applicants.

Diplomat Emeritus. Retired or deceased diplomates who have rendered significant service to the ABFO or achieved special qualifications in forensic odontology may be invited to become Diplomat Emeritus. Ten percent of the Diplomates that are in good standing with the ABFO or a minimum of ten Diplomates, whichever is greater, can submit in writing, the name of a retired or deceased diplomate for this honor. The Board of Directors may confirm only one nominee per annual term. The Diplomat Emeritus status must be confirmed by unanimous invitation of the Board of Directors.

A Diplomat Emeritus shall be afforded the same rights and opportunities to participate in all ABFO activities as any other active Diplomat, with the exception of voting on ABFO matters. A Diplomat Emeritus will not be required to pay annual dues. A Diplomat Emeritus will receive the same correspondence as active Diplomates except for the annual dues billing invoice and will be maintained on the active ABFO Diplomat e-mail roster.

Section 4. Certification.

a. Standards. . The Board of Directors shall establish, maintain, and revise as necessary, standards and qualifications for the granting, issuing and renewing of certificates and/or other forms of recognition in the cognizance of special qualifications in forensic odontology. The policies and procedures established for evaluation of candidates for ABFO Diplomat status are fair, objective, and non-discriminatory and comply with all federal, state and local laws regarding such policies and procedure.

b. Evaluation of Applicants. The Board of Directors shall arrange for suitable means to evaluate the fitness, competence, and qualifications of persons seeking certification by the ABFO. These functions shall be carried out, in part, by a Certification and examination Committee by appropriate examination of the candidates for Certificates of Qualification in Forensic Odontology.

c. Certificates. The Board of Directors shall have authority to issue, or cause to be issued, Certificates of Qualification in Forensic Odontology to persons who have met the standards of the Board and have fully complied with all applicable requirements. Certificates of Qualification shall be in such forms as prescribed or approved by the Board of Directors. Each certificate shall be and remain the property of the ABFO, but every person to whom a certificate has been properly issued shall be

entitled to its continued possession unless and until such certificate is revoked. A person holding a valid, Certificate of Qualification issued by the ABFO shall be entitled to use the designation “board certified”, “Diplomate of the American Board of Forensic Odontology”, and/or D-ABFO.

d. Fees. The Board of Directors shall establish the fees and other charges incident to application for granting, issuing, and renewal of Certificates of Qualification and/or other forms of recognition.

e. Denial, Suspension and Revocation of Certificates. The right to deny Certification or to suspend or revoke Certificates of Qualification shall reside with the Board of Directors. Certificates issued by the Board are subject to revocation by two-thirds (2/3) vote of the Board of Directors for one or more of the following reasons:

(1) A misstatement or misrepresentation, or concealment or other omission of one or more material fact or facts in an application or any other communication to the Board or its representative(s).

(2) Misleading or perjurious statements in sworn testimony.

(3) Conviction of an applicant for certification or a holder of a certificate of this Board by a court of competent jurisdiction of a felony or of any crime involving, in the opinion of the Board of Directors, moral turpitude.

(4) Issuance of a certificate contrary to or in violation of any of the laws, standards, rules or regulations governing the Board and its certification programs at the time of its issuance; or determination that the person certified was not in fact eligible to receive such certificate at the time of its issuance.

(5) Conduct on the part of a holder of a Certificate of this Board tending to or acting to impede, discourage, or contradict the purposes of this Board as expressed in the Preamble, Section 3, herein.

(6) Nonpayment of fees by six (6) months from the invoice date will result in the revocation of the certificate by the Board of Directors at the next annual meeting. Action to suspend or revoke certification may only be taken after at least ninety (90) days advance notice of the nature of the charges or reasons for such action has been given to the individual concerned, and an opportunity for such person to be heard has been provided by the Board. Hearings concerning suspension and/or revocation will be held without legal representation on either side. (See Article II, Section 6).

f. Appeal following denial of qualifications to take the Examination.

An applicant to the Board, who has not met the qualifications to take the examination, as determined by the committee, may file a written notice of appeal to the President of the ABFO. He/she shall state why, as an applicant he/she thinks that he/she is qualified, within twenty days of his/her notification (by certified mail, return receipt requested).

(1) The President shall then send a copy of this notice of appeal to each member of the Board of Directors. Each member of the Board will reply, in writing, within twenty days of his/ her receipt of the copy of the notice of appeal to the President.

(2) Each Board member shall indicate his/her approval or disapproval of the grounds cited in the appeal.

(3) A favorable simple majority vote by the Board of Directors on the applicant's previous denial by the Certification and Examination Committee shall constitute a reversal of its decision.

(4) In the event a simple majority of the Board of Directors upholds the decision of the Certification and Examination Committee and denies the appeal, the applicant may ask for a formal hearing at the next annual called meeting of the Board of Directors. The decision of a simple majority of the Board of Directors at that meeting will be final.

g. Appeal Following Failure of an Examination. A candidate to the Board who has not successfully passed an examination given by the Certification and Examination Committee to qualify for diplomate status, may file a written notice of appeal to the President of the ABFO within twenty days of his/her notification of failure (by certified mail, return receipt requested). He/she shall state in the notice of appeal the specific grounds for the appeal.

(1) The President shall then send a copy of this notice of appeal to each member of the Board of Directors. Each member of the Board of Directors will reply within twenty days of his/her receipt of the copy of the notice of appeal to the President

(2) Each Board member shall indicate his/her approval or disapproval of the grounds cited in the appeal.

(3) A favorable simple majority vote by the Board of Directors on the candidate's previous denial of certification by the Certification and Examination committee shall constitute a reversal of this decision.

(4) In the event a simple majority of the Board of Directors upholds the decision of the Certification and Examination Committee and denies the appeal, the candidate may ask for a formal hearing at the next annual called meeting of the Board of Directors. The decision of a simple majority of the Board of Directors at that meeting will be final.

h. Recertification. The ABFO requires recertification every five years. This is the responsibility of the Certification and Examination Committee. This committee shall devise the format and areas necessary for review and administer the mandatory Recertification Examination, all of which shall be approved by the Board of Directors. The committee will evaluate the diplomates' material submitted for recertification and notify the Board of Directors of their recommendations concerning each diplomate being considered for recertification.

i. Reinstatement of "retired", or "resigned" Diplomates

A Diplomate who has retired, or resigned wishing to be returned to active Diplomate status must reapply to the ABFO and fulfill all current requirements for new applicants.

Section 5. Eligibility to Hold Office

Only Diplomates in good standing shall be eligible to hold office. A diplomate may not be nominated for office, vote or otherwise engage in the business of the Board if his/her annual fees

are not current. The Board of Directors, by two-thirds (2/3) majority, under unusual circumstances, may waive this requirement.

Section 6. Fee Obligations.

The annual fee period shall be the calendar year, January 1 to December 31. A penalty of twenty-five dollars (\$25.00) will be levied for non-payment of the annual and/or recertification fees, ninety (90) days from the invoicing of the fees. Active diplomates requesting retired status prior to October 1st in the year their annual fee has been paid are exempt from paying the annual fee for the following calendar year and thereafter, pending confirming action on their request by the Board of Directors.

Section 7. Binding Arbitration.

All diplomates and applicants for certification shall agree to be bound by the following:

- a.** The parties agree that any controversy or claim arising out of or relating to the American Board of Forensic Odontology (ABFO), its Bylaws, or its actions as a private, professional credentialing organization, or this agreement, or the breach thereof, whether involving a claim in tort, contract or otherwise, shall be settled by final binding arbitration administered by the American Arbitration Association in accordance with its rules.
- b.** “Parties” means all members of the ABFO or applicants thereto. This Arbitration Agreement is mandatory for all members of the ABFO, active, retired, suspended, and emeritus. No personal signature is needed to endorse this Agreement Application.
- c.** The arbitration shall be before one neutral arbitrator to be selected in accordance with the Commercial Rules of the American Arbitration Association. The arbitration shall proceed under the Expedited Procedures of those Rules.
- d.** These arbitration proceedings are initiated by the complaining party serving a written demand for arbitration upon the other party. The written demand shall contain a detailed statement of the matter and facts supporting the demand and include copies of all related documents.
- e.** At least 30 days before the arbitration, the parties must exchange lists of witnesses, including any experts and copies of all exhibits to be used at the arbitration. Arbitration must be initiated within two years after the alleged controversy or claim occurred by submitting a written demand to the other party.
- f.** The arbitration proceedings shall be conducted during the American Board of Forensic Odontology annual meeting, unless the parties agree to other arrangements.

g. The parties agree that the arbitrator shall first rule that the claim is bona fide and not vexatious or frivolous. Then the issue of liability will be determined prior to receiving evidence or testimony on any damage claim. In the event that liability is found, the arbitration proceeding shall continue before the same arbitrator to resolve all damage issues. The decision of the arbitrator shall be final and binding. The arbitrator shall have no authority to make agreements containing material errors of law or to award punitive damages or to add to, modify, or refuse to enforce any agreements between the parties. The arbitrator shall make findings of fact and conclusions of law and shall have no authority to make any award which could not have been made by a court of law. The costs of arbitration of the prevailing party, are to be borne by the non-prevailing party, including reasonable attorney's fees.

h. Judgment on any award rendered by the arbitrator may be entered in any court having jurisdiction thereof. In rendering the award, the arbitrator shall determine the rights and obligations of the parties according to the substantive procedural laws of Nevada.



ARTICLE II: CODE OF ETHICS AND CONDUCT

Section 1. The Code.

As a means to promote the highest quality of personal and professional conduct of its diplomates, the following constitutes the Code of Ethics, which is **to be** endorsed and adhered to by all diplomates of the American Board of Forensic Odontology:

- a.** Every diplomate of the ABFO shall refrain from any material misrepresentation of education, training, or area of expertise.

- b.** Every diplomate of the ABFO shall refrain from any material misrepresentation of data upon which an expert opinion or conclusion is based.

- c.** Every diplomate of the ABFO must provide a signed and notarized Ethics Statement adopted by the ABFO Executive Committee February, 2007 no later than September 1, 2007 and thereafter as directed by the Executive Committee.

Section 2. Guiding Principles.

Separate and distinct from the ABFO's mandatory Code of Ethics, yet essential to the attainment of the highest quality of professionalism, the following are deemed to be guiding principles, voluntarily endorsed by all diplomates of the ABFO:

- a.** The diplomate of the ABFO should maintain his/her professional competency through existing programs of continuing education.

- b.** A Diplomate of the ABFO may submit formal written allegations of violations concerning a fellow diplomate to the secretary of the ABFO (see judiciary process below) or to the Chairman of the Ethics Committee. Formal written allegations shall not include or imply partisanship or interest in a case except the proof of the facts and their correct interpretation.

- c.** Diplomates of the ABFO shall render technically correct statements in all written and oral reports, testimony, public addresses, or publications and should avoid any misleading or inaccurate claims.

Section 3. Grounds for Discipline.

Any diplomate whose professional conduct becomes adverse to the best interests and purposes of the ABFO shall be liable to censure, suspension, or expulsion and revocation of certification. The diplomate shall be censured, suspended or expelled by action of the ABFO Board of Directors acting on the findings and recommendations of the Ethics Committee. Investigative action may be initiated due to alleged violations under any of the following provisions of the bylaws:

- a.** Misrepresentation of one or more of the criteria for membership in the ABFO, Article I.

- b.** Violation of any of the provisions of the Code of Ethics, Article II, Section I.

c. The publication or issuance of public statements giving the appearance of or characterized as representing the ABFO on matters outside existing ABFO policy or which have not been worded, approved, and authorized by the Board of Directors.

Section 4. Investigative Body.

a. The standing Ethics Committee shall serve as the investigating body to which the Chairman of the Ethics Committee shall refer all cases for consideration.

b. The members of the Ethics Committee shall be elected by the diplomates. Each member, with the exception of the non-voting attorney member, will serve a three year term. The Ethics Committee shall elect a chairman from its membership annually.

c. The President of the ABFO may chair the Ethics Committee in the absence of the Ethics Committee chairman, if the chairman is under investigation, has a conflict of interest in that particular case, or for other valid reasons is unable to participate.

d. The Ethics Committee can order investigations and serve as a hearing agency concerning past or present conduct of individual members of the ABFO which may constitute a violation of the provisions of the Code of Ethics.

Section 5. Investigation Initiating Action.

The following are the ways by which the Ethics Committee may initiate investigative proceedings:

a. A diplomate of the ABFO may submit formal written allegations of violations concerning a diplomate to the secretary of the ABFO (see judiciary process below) or to the chairperson of the Ethics Committee.

b. The Ethics Committee may institute an inquiry based on any evidence brought to its attention which indicates the need for further query or positive action under the provisions of these bylaws. ABFO officers, upon receipt of a complaint concerning the professional or personal conduct of a diplomate, may refer the complaint to the Ethics Committee in writing, accompanied by a recommendation, concerning the need for further investigation. Such recommendations, however, shall not be binding on the Ethics Committee.

Section 6. Judiciary Process

- a.** Written allegations against a diplomate, when delivered to the ABFO Secretary, shall immediately be transmitted to the Chairman of the Ethics Committee.
- b.** The Ethics Committee shall immediately give notice of the filing of a complaint to the accused, and in accordance with the rules and regulations, assemble such written data from both the accused and accuser, that may permit the Ethics Committee to arrive at a preliminary determination whether the complaint is well founded and requires further investigation.
- c.** If the Ethics Committee, in its preliminary determination, finds that the complaint is not well founded, it shall dismiss the complaint. It shall issue a report of such determination to the Board of Directors, setting forth the basic facts and the reasons for its decision to dismiss.
- d.** If the Ethics Committee determines the complaint is well founded, the Ethics Committee will investigate the allegations. The Ethics Committee shall then formally hear the charges and shall give both the accused and the accuser(s) a reasonable opportunity to be heard and confront each other.
- (1)** Notice shall be sent by certified mail, return receipt requested, to both the accused and the accuser(s) for the purpose of setting up a formal hearing.
 - (2)** After receipt of the returned notice (by certified mail, return receipt requested), a formal hearing date will be mutually agreed to by both parties and the Ethics Committee. This date will be at least ninety days from said receipt of official notice in order to give both parties adequate time for preparation for the hearing. If agreeable to both parties, the hearing shall be held at or about the time of the annual meeting of the ABFO in order to keep the costs to a minimum. If one or both parties request hearing date at a time other than the annual meeting, the costs of said hearing shall be the responsibility of the party/parties requesting the hearing and not the ABFO.
 - (3)** At this hearing, no legal counsel for either party may be present. The non-voting attorney member of the ABFO, as a non-voting member of the Ethics Committee, will be present for the purpose of assuring that propriety, protocol and adherence to proper procedures are maintained during the hearing. The attorney Board member shall act in an advisory position to the committee only and of the hearing(s) shall not be involved in the presentation of the case for either party.
 - (4)** The Accused shall receive a copy of the written complaint. He/she is entitled to see the document in its entire form.
 - (5)** The Ethics Committee shall make a report, which will include a recommendation to the ABFO Board of Directors at the conclusion
- e.** Upon a vote of three-fourths (3/4) of the members of the Board of Directors, present and voting, the party accused of unethical or wrongful conduct may be censured, suspended, or expelled, but the accused shall have the right to appeal such

action to the diplomates of the ABFO. No Board of Director member, or member of the Ethics Committee who is the subject of a pending accusation under the provisions of the ABFO Code of Ethics, shall sit in deliberation on any matter concerning ethics.

f. The accused has the right to appeal the action of the Board of Directors to the diplomates of the ABFO. In effecting an appeal, the appellant must file a brief typewritten notice of the appeal, together with any typewritten statement he/she may wish to submit in his/her behalf, with the ABFO secretary not less than ninety days prior to the next annual meeting of the ABFO. The secretary shall immediately advise each member of the Board of Directors of the appeal and shall forward to each a copy of the supporting papers submitted by the appellant.

g. The Executive Committee shall then prepare a written statement of the reasons for the Board of Directors actions and file the same with the ABFO secretary not less than forty-five days prior to the next annual meeting.

h. Within ten days thereafter, the ABFO secretary shall mail to each voting diplomate of the ABFO a copy of the appellant's notice of appeal and his/her supporting statement, if any, and a copy of the Board of Directors statement. The secretary shall arrange and schedule a closed hearing of the diplomates concerning the appellant's appeal. The individual charged may not sit in this closed meeting. The non-voting attorney member will be present at this meeting to assure propriety, protocol, and adherence to procedures are maintained during this closed hearing. The Board member attorney will not represent either party involved in the hearing.

i. A written vote of three-fourths (3/4) of the diplomates, present and voting at the closed meeting, shall be required to overrule the action of the Board of Directors in regard to censure, suspension, or expulsion of a diplomate.

Section 7. Confidentiality, Rules, and AAFS Ethics.

a. Any member of the Ethics Committee or the Board of Directors divulging confidential information on any past or present ethical inquiries other than written statements of the Board of Directors could be subject to charges in violation of the Code of Ethics.

b. The Ethics Committee shall formulate internal Rules and Procedures and from time to time propose changes to such Rules and Procedures designed to facilitate the expeditious, fair and discreet resolution of complaints or matters brought before the Ethics Committee. The Rules and Procedures, and any subsequent deletions, additions or amendments thereto, shall be subject to the approval of the Board of Directors.

c. In order to prevent a conflict of interest between the ABFO and the American Academy of Forensic Sciences (AAFS), a written report of the action of the Board of Directors of the ABFO concerning censure, suspension, or expulsion of a diplomate will be forwarded to the Chairman of the Ethics Committee of the AAFS. The AAFS Ethics Committee will be notified if a notice of appeal is filed and ultimately the results of said

appeal. It is assumed that if an ethical problem occurs with the Ethics Committee of the AAFS, with an ABFO diplomate who is a member of the AAFS, a report would be given to the President or Secretary or Chairman of the Ethics Committee of the ABFO for any consideration or action.

ARTICLE III: MEETINGS

Section 1. Annual Meetings of the Board of Directors.

At least one meeting of the Board of Directors shall be held each year at the call of the President, at a location designated by him/her within or without the state of Nevada. Notice of meetings shall be provided to each Director at least thirty days before the meeting date. A meeting may, upon written consent of two-thirds (2/3) of the Directors in office, be conducted by mail or by electronic conference. Notwithstanding the above, it shall be the intent of these Bylaws that the Board of Directors hold two meetings each year whenever circumstances permit.

a. First meeting. The first meeting of the Board of Directors shall be held as nearly following the Annual Diplomates Meeting as is practical. Along with other business, the adoption and approval of an annual budget shall be accomplished.

b. Second meeting. The second meeting of the Board of Directors shall be held as nearly before the Annual Diplomates Meeting as is practical.

Section 2. Special meetings of the Board of Directors.

Special meetings may be called by the President, or upon the written request of a majority of the Directors in office, on a date and at a time and location to be designated by the President, within or without the state of Nevada. Notice of a special meeting shall be given to each Director at least fifteen days before the meeting date, with information regarding the subject(s) to be considered.

Section 3. Conduct of Board of Directors Business.

a. Business of the Board of Directors may be conducted by mail, by electronic conference, by conference call, or by electronic mail (email) when specific business is deemed necessary by the chair of the Board of Directors. When conducted electronically via e-mail all of the discussion and votes should be copied (cc'd) to all members of the BOD.

b. Business of the Board of Directors carried on by mail, by electronic conference, by conference call or by electronic mail (email) shall be conducted in accordance with the general spirit of these by laws and the requirements of the ABFO Articles of Incorporation.

c. When business is conducted by mail, by electronic conference, by conference call, or by electronic mail (email) requires a vote by the Board of Directors, the action must consist of votes made by a majority of the members of the Board of Directors (a quorum). A simple majority vote of the Directors in office, who vote, providing they comprise a quorum, shall be required to carry a motion.

- d.** When the chair receives a motion, and that motion has been seconded, he/she will direct the secretary to submit the motion to the Board of Directors for their consideration.

- e.** A period of ten (10) days will be allowed for discussion of the motion using the chosen method of communication. When using electronic mail (e-mail) a return receipt request will be used by the secretary to show receipt of the motion.

- f.** After the ten (10) day discussion period the vote will be called by the chair. Voting will be conducted within five (5) days. The ballots are to be sent to the secretary for tabulation. It is the responsibility of the secretary to notify the Board of Directors of the balloting results following the five (5) day balloting period.

- g.** This method of balloting may be used for all ABFO business except for repeal or amendment of previous bylaws and other situations requiring a two-thirds majority vote, unless the Board of Directors adheres to the procedures spelled out in Article III, Sections 1 and 2. of the ABFO bylaws.

Section 4. The Diplomates Annual Meeting.

The annual meeting will be held at the call of the President at a location designated by him/her within or without the State of Nevada. In the absence of the President, the President Elect shall assume the duties of the President. Notice of the meeting shall be given to each diplomate at least thirty days prior to the meeting date. Upon unusual circumstances and with approval of two-thirds (2/3) of the Board of Directors, the diplomates annual meeting may be postponed.

Section 5. Territory.

The operations of the Board are to be conducted in the United States of America and its territories and possessions and in such other place(s) as the Board of Directors may, from time to time, authorize and direct.

Section 6. Quorum.

- a. Board of Directors, Executive Committee and all other committees.** A quorum for all purposes herein, unless otherwise provided, shall consist of a majority of the members of the Directors, Executive Committee, or other committees. In the event that less than these numbers are present at a meeting, the President or Chairman may adjourn the meeting for not longer than thirty days under the same call. No Director shall be entitled to vote or be counted toward a quorum through the use of a written proxy.

- b. Diplomates.** One-fourth (1/4) of the active ABFO membership, in a called meeting of the ABFO, shall constitute a quorum for the conduction of business.

ARTICLE IV: OFFICERS AND MANAGEMENT

Section 1. Board of Directors.

a. Authority. The Governing board of the Corporation, as set forth in the Articles of Incorporation, shall be a Board of Directors, which shall be empowered to have, hold, control, manage, and administer all of the property, funds, business affairs, and operations of the ABFO pursuant to its Articles, with authority to do everything necessary and desirable in the conduct of the affairs and business of the ABFO and in accordance with these Bylaws. The Board of Directors (BOD) shall have the authority to administer the functions of the organization including changes to policies and procedures. Such changes shall require a majority vote of the BOD. Proposed changes in policies and procedures shall not conflict with Articles, Bylaws, Standards or Guidelines. The BOD shall not have the authority to change, amend or otherwise alter ABFO Bylaws, Standards, or Guidelines without approval of a vote by ABFO Diplomates following established procedures.

b. Composition. The Board of Directors shall consist of the six officers of the corporation (President, President Elect, Vice President, Secretary, Treasurer and Immediate Past President), and no more than fifteen other directors, all elected by the Diplomates from the names submitted by the Nominating Committee and by nominations from the floor.

c. Qualification of Directors.

(1) Directors shall be Diplomates in good standing in the ABFO. They shall be chosen with due regard for their general attainments and their professional qualifications and experience in forensic odontology and/or closely related fields.

(2) At the discretion of the Board of Directors, one additional position on the Board of Directors may be held by a duly qualified attorney at law who shall not be required to be a Diplomat of the ABFO. This individual shall NOT have voting privileges and shall not be eligible to hold office or chair committees.

d. Term of Directors. The terms of all directors shall be for three years. Five terms expire each year. Directors shall be limited to a maximum of two consecutive three-year terms. This limitation shall not apply to the attorney described previously in this Article.

e. Duties and Functions. The duties and functions of the Board of Directors shall be as follows:

(1). The Board of Directors shall exercise overall control over the affairs and operations of the ABFO.

(2) The Board of Directors shall be charged with making recommendations to the general membership for establishing, modifying, upgrading, and maintaining bylaws, standards and guidelines for the specialty of forensic odontology, in accordance with the Articles of Incorporation and these Bylaws. These shall not be discriminatory, but apply to all persons on an equal basis.

(3) The Board of Directors shall, under normal circumstances, hold at least two meetings annually: the first following the annual diplomates meeting; the second directly before the annual diplomates meeting. The Board of Directors may hold additional meetings on reasonable notice and upon written request of a majority of the Directors.

(4) The Board of Directors shall adopt, and approve, an annual budget for the operation of the ABFO at the first meeting following the annual diplomates meeting.

(5) The Board of Directors may, from time to time, designate qualified persons, who need not be directors, or organizations to act on their behalf in performing such duties and functions as the Board of Directors may direct. Such persons and organizations may be compensated for their services and reimbursed for the actual and necessary expenses incurred in the discharge of such duties and functions, and shall serve at the pleasure of the Board of Directors.

(6) The Board of Directors may remove from office, any officer, director, or elected committee member, by a two-thirds (2/3) vote of the Board of Directors for any of the following:

(a) Non-attendance at two consecutive meetings without reasonable cause.

(b) Misfeasance, malfeasance or nonfeasance of his/her duties. Conviction of a Director or officer by a court of competent jurisdiction, of a felony, or of any crime involving the operation of the Board of Directors, shall result in automatic and immediate expulsion from office.

f. Voting at Board of Directors meetings. Unless otherwise specifically stated or implied elsewhere in these Bylaws, all actions of the Board of Directors shall be decided by a simple majority of the Board of Directors present at a meeting or by a qualified electronic vote at which a quorum has been established.

g. Vacancies. A vacancy in the position of a director may be filled by a two thirds (2/3) vote of the remaining directors, if the Executive Committee deems the replacement necessary.

Section 2. Officers

a. Officers of the Corporation. The officers of the Corporation shall be: President, President Elect, Vice President, Secretary, Treasurer and Immediate Past President. They shall be elected by the Diplomates from a slate of names provided by the Nominating Committee, at the annual diplomates meeting. The President, having been elected to the office of President Elect the previous year, assumes the office automatically (DRM p.57 **Administrative Information – Protocol for Selecting Candidates for Elected Positions** “**President (1 year term)**). The Immediate Past President also assumes office immediately at the conclusion of his/her term as President.

b. The officers of the corporation shall serve, in the same respective capacities, as officers of the Board of Directors.

c. Qualifications:

(1) **President/President Elect, and Vice President.** Candidates for these offices shall have served at least one complete year as Secretary or Treasurer of this

organization, and shall be a current member of the Board of Directors, as either a director or one of the officers.

(2) Secretary and Treasurer. Candidates for these offices shall be a current or past member of the Board of Directors, as either a director or one of the officers.

d. Term of Office. The officers shall take office at the conclusion of the annual diplomates meeting following their election. The term of office of President, President Elect, and Vice President shall be for one year, or until his/her successor has been duly elected and qualified. The term of office of Secretary and Treasurer shall be for two years and they shall be elected in alternate years (Secretary in even years, Treasurer in odd years) These officers shall be elected at the annual diplomates meeting, with the exception that the office of President shall be automatically assumed by the diplomate elected President Elect the previous year.

e. Line of Succession. It is the wish and intent of these Bylaws to establish a logical progression of the officers through a “Line of Succession.” This will help to insure that candidates for the Presidency will be sufficiently familiar with the workings and functions of the ABFO to be able to step into the position with as little transition time as possible. However, if for any reason, the diplomates, Board of Directors, or officers wish to circumvent this “Line of Succession”, they may, by nominating and electing other qualified diplomates.

f. Functions and Duties. The functions and duties of the officers shall be such as usually and customarily pertain to their respective offices, and also such other functions and duties as may from time to time, be delegated or designated by the Board of Directors or as herein prescribed.

g. Vacancies. The President Elect shall assume the duties of the office of President if such a vacancy should occur during the current term. Other vacancies shall be filled by qualified directors by a two-third (2/3) vote of the Board of Directors, at any regular or special meeting, by mail, by electronic conference, by conference call, or by electronic mail (email) when specific business is deemed necessary by the chair of the Board of Directors if no regular meeting is scheduled within thirty days of such vacancy.

h. When a director is elected to an office and if his/her term as director has not expired at the time of election, he/she must immediately resign that position as Director.

Section 3. Executive Committee.

a. Composition. The Executive Committee of the Board of Directors shall consist of the President, who shall serve as its chairman, the President Elect, the Vice President, the Secretary, the Treasurer and the immediate Past President. A quorum of the Executive Committee shall consist of a majority of its members and its formal actions shall require a majority vote of the entire committee unless otherwise provided herein.

b. Authority The Board of Directors may grant and/or assign to the Executive Committee, those powers and authorities, which it deems necessary, to act for and on behalf of the Board of Directors between meetings, unless otherwise prohibited in these Bylaws. Actions taken by the Executive Committee on behalf of the Board of Directors shall be reported to the Board of Directors at its next meeting.

c. Limitations. The Executive Committee shall not have, or be granted, the power to change these Bylaws.

Section 4. Nominating Committee.

- a.** The Nominating Committee shall submit a slate of names of qualified diplomates for elections, as set forth in these Bylaws.
- (1) The Nominating Committee shall submit two names for each expiring and/or vacated director position, plus two more additional names.
 - (2) The Nominating Committee shall submit two names for each expiring committee position that is open for election.
 - (3) No member of the Nominating Committee can be nominated to an elected office.
 - (4) The Nominating Committee shall submit at least one name for each executive office that is open for election.
 - (5) The above nominations shall be made and submitted to the Board of Directors, at least thirty days prior to the annual diplomates meeting. This information shall be disseminated to the diplomates at least fifteen days prior to the meeting.
- b.** The Board of Directors may, at their discretion, nominate any person or persons qualified under these Bylaws, if the Nominating Committee fails to comply with the requirements as set forth in this Article.
- c.** Nominations of qualified diplomates for officers, directors, and elected committee members may also be made by any diplomate at the annual diplomates meeting, with the prior approval of the candidate being nominated from the floor.

Section 5. Elections.

- a. Annual Elections.** Shall be held at the annual diplomates meeting, provided a quorum has been established. If a quorum cannot be established, the Board of Directors shall convene a special meeting and perform the election duties.
- b. Authority.** The Board of Directors may grant and/or assign to the Executive Committee, those powers and authorities, which it deems necessary, to act for and on behalf of the Board of Directors between meetings, unless otherwise prohibited in these Bylaws. Actions taken by the Executive Committee on behalf of the Board of Directors shall be reported to the Board of Directors at its next meeting.
- c. The order of elections.** Shall be as follows: President Elect, Vice President, Secretary or Treasurer, Certification and Examination Committee, Ethics Committee, and Directors
- d.** In each case, those candidates receiving the greater number of votes will be elected.

ARTICLE V: COMMITTEES

Section 1. Special Committees.

The President may appoint, with the advice and consent of the majority of the Board of Directors, special committees as deemed necessary. These appointments are to run for one-year terms, unless extended by the Board of Directors.

Section 2. Standing Committees for Administrative Purposes.

Articles and Bylaws, Nominating, Planning, Research and Public Relations Committees.

a. Composition:

(1) Articles and Bylaws. This committee shall consist of at least six members, each serving a three year term, as designated by the President with the advice and consent of the majority of the Board of Directors. Each year the President shall designate two members to replace the two outgoing members. The chairman, designated by the President, shall be one of the two members serving the third year of their term. Membership is limited to only one consecutive three-year term.

(2) Nominating. This committee shall consist of five members. Two of the members shall be the most recent active past presidents. The others shall be appointed for a one-year term, by the President with the advice and consent of a majority of the Board of Directors. Of these, two shall be from the diplomate membership at large, and one shall be a member of the Board of Directors, but not a member of the Executive Committee. The chairman of this committee shall be the Past President who has been on the committee the longest.

(4) Research. This committee shall consist of five members, each serving a five year term, as designated by the majority of the Board of Directors. Each year, the Board of Directors shall designate one member to replace the one out going member. The chairman shall be selected by a majority of the committee members at or about the time of the annual meeting of the Board of Directors. There shall be no limit on the number of consecutive terms that may be served. Members of this committee should have demonstrated competence in the field of scientific research. Committee members should have:

- (a)** Published at least one article in a refereed journal, and/or:
- (b)** Demonstrated training in research methodology, and research protocol development, and/or:
- (c)** Experience in submission of grant proposals (funded research).

b. Duties and Responsibilities:

(1) Articles and Bylaws. This committee shall review and recommend any changes to the Articles of Incorporation and/or the Bylaws that the committee feels are necessary, or that are recommended by the Board of Directors.

(2) Nominating. This committee shall, at least thirty days prior to the annual meeting, submit the names of qualified directors whom they recommend for the office of President, Vice President, Secretary or Treasurer. The Nominating Committee shall also submit the names of qualified diplomates whom they recommend for membership on the Certification and Examination Committee, the Ethics Committee, and the Board of Directors.

(3) Planning. This committee shall review and suggest plans to maintain the standards and goals of the ABFO.

(4) Research This committee shall review research projects and new techniques and recommend further research prior to acceptance of the new techniques by the Diplomates of the ABFO. These projects shall be submitted to the committee in a confidential manner in order to protect the integrity of the project being considered. The committee is encouraged to conduct research and recommend appropriate guidelines in scientific methodology, techniques and equipment for forensic odontologists.

Section 3. Standing Committees for Standards, Methods and Procedures.

Civil Litigation, Bitemark and Patterned Injury, Human Abuse and Neglect, Dental Identification Age Estimation and Metrology Committees.

a. Composition. The chairperson of these committees shall be appointed for two year terms by the President, with the advice and consent of a majority of the Board of Directors. Membership on these committees will be by appointment by the President upon consideration of the recommendation of the chairman.

b. Duties. These committees have the purpose of encouraging the study of, improving the practice of, enhancing the standards for, and advancing the specialty areas of forensic odontology.

Section 4. Certification and Examination Committee.

a. Composition. The committee shall consist of five members from the Diplomates at large. They shall be elected by the diplomates from a slate of candidates selected by the Nominating Committee. Members shall serve staggered five year terms. A new member shall be elected each year from a slate of candidates to replace the outgoing member whose term is expiring. A vacancy on this committee shall be filled by a two-thirds (2/3) vote of approval by the Board of Directors, of a candidate nominated by the President. This shall be done as soon as practical after the vacancy occurs and for the unexpired term of said office. Such election may be conducted by mail ballot. The chairman of this committee shall be the diplomate serving the fourth year of a five year term. The immediate past chairman remains on the committee for the fifth year to give continuity to the committee and to reassume the chair should a vacancy occur.

Membership is limited to one consecutive five-year term.

b. Duties. This committee shall implement and administer the ABFO's purposes of establishing regulations, standards, and requirements for the granting and the renewal of diplomate status. The committee will treat all candidate information as strictly confidential. All decisions regarding requirements, policies, procedures, fees, recertification, appeals, and other matters of material significance, shall be approved by the Board of Directors prior to implementation. The committee will establish a database repository of the ABFO examination candidate's oral presentation and oral examination scores. The scores will be stored anonymously to be accessible by the CE committee as needed in the future.

Section 5. Ethics Committee:

a. Composition. This committee shall be composed of three voting members and one non-voting member. The non-voting member shall be the attorney on the Board of Directors. The voting members shall be from the diplomates at large and shall be elected by the diplomates from a slate of candidates selected by the Nominating Committee, for staggered three-year terms, with a maximum of one consecutive three year term.

Members involved in a particular ethics issue will remain on the committee until that issue is resolved, in order to maintain continuity. A vacancy on this committee shall be filled by a two-thirds (2/3) vote of the Board of Directors within a reasonable time after the vacancy occurs and for the unexpired term of said office. Such election may be conducted by mail or email ballot

b. Duties. The Ethics Committee shall implement and administer the ABFO's purposes of encouraging and promoting high standards of ethics, conduct, and professional practice by forensic odontologists. The committee shall review the ABFO's Code of Ethics and make recommendations to the Board of Directors as to improvements, additions, or modification. The committee shall also review matters of possible violations of these standards and make the appropriate recommendations to the Board of Directors as set forth in the procedures detailed in the Code of Ethics.

c. Conflicts of interest. No person that is involved in any manner in a case being considered, shall be allowed to serve on the Ethics Committee or sit in the closed Board of Directors meetings, or the subsequent closed diplomates meeting, if one is requested, considering that case.

Section 6. Strategic Plan Committee

a. Composition: The Committee shall consist of five members (5), one of whom will be the ABFO President, representing the Executive Committee. The President cannot be the Chairman of the Strategic Plan Committee (SPC) while holding the office of President of the ABFO. The President will appoint the Chair of the SPC and the Chair will appoint the other three members.

b. Duties: The Strategic Plan Committee will be responsible for evaluating the current status, activities and goals of all committees. After the evaluation of the current status of all committees, the SPC will develop lists of activities and goal for each committee that will be forwarded to the individual chairs of all ABFO Committees no later than April 1 of each year. The Committee chairs will then develop a working plan for their committee, with consideration to the action plan forwarded by the SPC and activities the individual committee identifies as its goals. Each committee chair will prepare and forward to the SPC the working plan for the year no later than August 1 each year. The SPC will then prepare and forward a mid-year report to the Executive Committee before the mid-year meeting of the Executive Committee. The SPC shall also consider all proposed changes to the bylaws, standards and guidelines and report their findings to the EC. (Following procedures outlined for these changes)

c. Goals: The goal of the SPC is to develop a forward thinking, dynamic evolutionary plan that will track the present status of the ABFO and provide the pathway to the future. Annual Work Product of each ABFO Committee utilizing the ABFO Strategic

Plan will ensure that the ABFO moves forward as the science of forensic odontology evolves over time.

Section 7.

The President shall be an ex-officio (voting) member of all committees without the need to resign his/her position on the Board of Directors, as provided above. The President may appoint a member of the EC to act as a liaison to any Committee of the ABFO. Any member of the EC appointed as a liaison shall not be a voting member of that Committee.

Section 8.

The Board of Directors shall reserve the power to adjust the length of terms of individual committee chairmen and members to conform to these Bylaws.

ARTICLE VI: FUNDS AND EXPENDITURES

Section I. Income and Expenditures.

Funds for meeting the expenses of the ABFO shall be raised by annual fees, voluntary contributions, fees associated with certification and examination, and such income as may come to the ABFO through the collective efforts of its members. All disbursements shall be made by the Treasurer.

Section 2. Bi-annual Audit.

Under the direction of the Treasurer, a bi-annual audit of the ABFO financial records shall be made by an ad hoc committee of two Directors appointed by the President. Said audit shall be delivered at the Diplomates' annual meeting in the years the audit is obtained. The Directors may, by two thirds (2/3) vote; request a certified audit by a certified public accountant. The audit will be concurrent with the election of the new Treasurer.

Section 3. Fiscal Year.

The fiscal year of the ABFO shall be from the first day of March to the last day of February of each and every year.

Section 4. Indemnity, Surety, and Fidelity.

a. Indemnification. Each present and future board member and elected officer, whether or not then in office, shall be indemnified by the ABFO against expenses actually and necessarily incurred by or imposed upon him/her (including, but not without being limited to, judgments, costs, and counsel fees) in connection with the defense of the action, suit or proceeding in which he/she is made a party by reason of being or having been a director or officer of the ABFO except in relation to matters as to which he/she shall be adjudged in such action, suit or proceeding, to be liable for negligence or misconduct in the performance of duty for the ABFO. Such indemnification shall not be

deemed exclusive of other rights to which such director or officer may be entitled, or as a matter of law, or otherwise.

b. Surety. The Board of Directors may, at their discretion, procure or cause to be procured, at the Board's expense, appropriate liability insurance coverage for the ABFO's officers, directors, diplomates, agents and employees, past and present.

c. Fidelity Bonds. The Treasurer and/or other duly authorized personnel may be required to produce a fidelity bond. The expense of such bonds will be approved and paid for, by the ABFO.

Section 5. Compensation and Reimbursement.

No member of the Board of Directors shall be paid any salary or fee for his/her services as a director or as an officer. Subject to the availability of funds, a director or officer may be reimbursed for actual, reasonable necessary and documented expenses incurred by him/her in attending meetings of the Board of Directors or in performing other duties or functions on behalf of the Board. The Board of Directors shall determine compensation and reimbursement to be paid to parties other than officers and directors of the Board, for services performed or for activities carried out on behalf of the Board.



ARTICLE VII: MISCELLANEOUS PROVISIONS

Section 1. Definitions.

All definitions of terms and words herein, unless applicable law otherwise requires, shall be defined by the Articles of Incorporation, the Bylaws, or the Board of Directors, in that order of preference.

Section 2. Seal and Insignia.

The Board shall have a corporate seal, and may have other devices and insignia, of such design as the Board of Directors adopt.

Section 3. Parliamentary Authority.

All parliamentary procedures at meetings of the Board of Directors, Executive Committee, diplomates, and other committees, shall be governed by the latest edition of *Sturgis' Standard Code of Parliamentary Procedure* except where otherwise provided in the Articles and/or Bylaws. A parliamentarian may be appointed by the presiding officer for any meeting under the auspices of this Board.



ARTICLE VIII: AMENDMENTS

Section 1. Repeal or Amendment of Previous Bylaws.

After considering the recommendations of the Strategic Planning Committee, the Articles and Bylaws Committee, and the Board of Directors, the Diplomates of the ABFO shall establish, modify, upgrade, and maintain Bylaws, Standards and Guidelines for the Specialty of Forensic Odontology, in accordance with the Articles of Incorporation and these Bylaws. The Bylaws, Standards, and Guidelines shall not be discriminatory, but shall apply to all on an equal basis.

Bylaws, Standards, and Guidelines changes shall become effective at the close of the meeting at which they are approved by a simple majority vote of the active Diplomates of the ABFO following the procedural rules. The Bylaws, Standards, and Guidelines replaced or repealed as well as prior resolutions, rules, and regulations, which are in conflict with the new Bylaws are concurrently repealed.

Section 2. Amendment Procedures.

Any part of these Bylaws may be amended, altered, or repealed, in whole or in part, in the following ways:

- 1.** The proposed change is to be submitted, in writing, to the President of the ABFO and to the Chairpersons of the Strategic Planning (SPC) and Articles and Bylaws (ABC) Committees on or before July 1st in the year prior to the next annual meeting at which it will be considered for adoption.
- 2.** The SPC and ABC members will study the proposed revision and report their recommendations to the Executive Committee (EC) on or before September 1st in the year prior to the next annual meeting at which it will be considered for adoption. The EC, after considering the recommendations will submit the recommendations to the Board of Directors (BOD) for a vote. In the event the SPC or ABC fails to report their recommendations, the Executive Committee may elect to continue the adoption procedures in consultation with and approval by a majority of members of the BOD.
- 3.** If approved, the Executive Committee will inform the Diplomates by mail or email of the proposed change(s), the SPC recommendations and the date of the annual meeting at which the proposal will be considered and voted upon by the membership. This written announcement must be made by November 1st in the year prior to the next annual meeting at which the issue(s) will be considered.
- 4.** The proposed change(s) shall be on the agenda of the meeting of the Board of Directors and Diplomates.
- 5.** The proposed change(s) shall be considered at the annual meeting of the Diplomates provided the above referenced requirements have been met. The change(s) can be proposed for consideration during the meeting at the time of the report of the SPC or as new business as directed by the presiding officer.

6. The adoption of the change will require a majority vote of all certified Diplomates or a two-thirds (2/3) majority of the Diplomates in attendance, whichever is less. If the latter, a quorum is required.
7. The results of the action of the Diplomates shall be reported to the Diplomates at large by April 1st of the year in which the changes were adopted.



SECTION III

Policies, Procedures, Standards and Guidelines

ADMINISTRATIVE INFORMATION

Nominating Committee

Protocol for Selecting Candidates for Elected Positions

President (*1 year term*) - No nominations required as the President Elect automatically assumes this position at the end of the current president's term.

President Elect (*1 year term*) - One nominee who is the current Vice President of the ABFO.

Vice President (*1 year term*) - One nominee who is the current Secretary or Treasurer whoever is completing his or her term of office at the present time.

Secretary (*2 year term*) - Two nominees shall be selected in even numbered years (i.e. 2006, 2008, 2010, etc.) for this office and must be a current or past member of the Board of Directors.

Treasurer (*2 year term*) - Two nominees shall be selected in odd numbered years (i.e. 2005, 2007, 2009, etc.) for this office and must be a current or past member of the Board of Directors.

Board of Directors (*3 year term*) - Two nominees shall be selected for each of the five vacancies plus two additional nominees which will occur each year in the Board of Directors. Nominees **cannot** be individuals that are ending their second consecutive three year term as a Director. Nominees are selected from the Diplomates at large.

Certification and Examination Committee (*5 year term*) - The nominating committee needs to submit two nominees for each vacancy that will become open in the ensuing Board year from the diplomates at large. To avoid conflicts of interest, members of this committee may not serve simultaneously as a Director.

Ethics Committee (*3 year term*) - The nominating committee should submit two nominees for each vacancy that will become open in the ensuing Board year from the diplomates at large. Nominees may not serve a second consecutive term on this committee. To avoid conflicts of interest, members of this committee may not serve simultaneously as a Director.

Duties and Responsibilities of Directors

Introduction: This description of duties and responsibilities is meant to be a dynamic listing. It should be reviewed annually by the outgoing officers and revisions submitted for inclusion in this listing.

MEMBER OF THE BOARD OF DIRECTORS

1. Conduct and supervise all business of the ABFO between meetings as outlined in the bylaws.
2. Attend all Board of Directors' and diplomates' meetings.
3. Be familiar with ABFO Bylaws, Code of Ethics, Articles of Incorporation, Standards and Guidelines.
4. Respond in a timely and thoughtful manner to any and all correspondence.
5. Serve a three (3) year term

PRESIDENT

1. Preside over all meetings of the Executive Committee, Board of Directors, and diplomates. The President, as Chair of the Executive Committee, will annually review and/or audit all records of the ABFO. The records of the ABFO shall be managed and disposed of in such a way as to ensure the integrity of the record keeping process and the confidentiality of the information. The records shall be kept indefinitely but should the Board of Directors determine that the records should be purged, records shall be retained for at least one full certification cycle for each currently active diplomate. Purged records will be destroyed in a manner that ensures security and confidentiality.
2. Immediately after the annual meeting of the diplomates, forward to the American Academy of Forensic Sciences (AAFS) a list of contact information of the new officers and Chair of the Certification and Examination Committee.
3. Remain familiar with the Bylaws, ethics code, articles of incorporation, standards and guidelines.
4. Answer all correspondence to the Board from attorneys, the AAFS and other organizations.
5. Assist the Secretary in resolving issues.
6. Direct all committee chairmen and oversee their progress.
7. Appoint officers and chairmen as directed by the bylaws.
8. Notify chairmen of their charges and committee membership as soon as possible after the annual meeting.
9. Serve a one year term.

PRESIDENT ELECT

1. Be thoroughly familiar with the Bylaws, Code of Ethics, Articles of Incorporation, Standards and Guidelines.
2. Monitor progress of the ABFO committees and assist as needed to insure that tasks are completed on time.
4. Assist President as needed.
5. Assist in the selection of appointed committee members and chairmen for the coming year.
6. Become familiar with duties of President.
7. Serve a one year term.

VICE PRESIDENT

1. Attend all ABFO Executive Committee, Board of Directors' and Diplomates' meetings.
2. Be thoroughly familiar with ABFO Bylaws, Code of Ethics, Articles of Incorporation, Standards and Guidelines.
3. Assist the Secretary and Treasurer with their duties as necessary.
4. Be familiar with the duties of the President Elect and President and be willing to assume their positions.
5. Make necessary meeting arrangements for all ABFO business meetings and notify attendees and/or secretary of the details.
6. Serve a one year term.

SECRETARY

1. Be prepared to commit to a seven-year term of service: two years as Secretary, one year as Vice President, one year as President Elect, one year as President, one year as Past President/Member Nominating Committee, and one year as Chairman of the Nominating Committee.
2. Be familiar with the duties of Vice President, President Elect, and President and be willing to commit to these offices.
3. Serve a two-year term as Secretary.
4. Become familiar with all sections of the *ABFO Diplomates Reference Manual*, including the ABFO Bylaws, Code of Ethics, and Articles of Incorporation, Standards & Guidelines.
5. Attend all meetings of the Executive Committee, Board of Directors, and combined directors and diplomates meetings and produce the minutes for same.
6. Be familiar with computer functions and applications used by the ABFO
7. Send all minutes and agendas to the Executive Committee members for approval.
8. In May, June and January, mail the minutes for the annual meetings and the Manual changes to the ABFO Webmaster for updating of the *ABFO Diplomates Reference Manual*.
9. In May, mail the minutes for the annual meetings to the office of the American Academy of Forensic Sciences (AAFS) and to the corporate attorney.
10. Send an updated roster of ABFO Officers and Directors to the AAFS and the corporate attorney.
11. Develop meeting agendas.
12. Develop ballots for elections.
13. Maintain an up-to-date list of committee membership using an Excel spread sheet
14. Keep the Executive Committee officers informed of any pertinent issues that may arise during the course of the year.
15. Contact AAFS office to have certification and recertification certificates made prior to the annual meetings in February. Apply the corporate seal to these certificates and have appropriate officers sign them prior to presentation.
16. Send all necessary documents to the corporate attorney as required by law.
17. Maintain the corporate seal/embosser.
18. Assure that copies of all critical documents and/or correspondence are preserved digitally and kept in a secure location.
19. Transfer the ABFO secretary materials and equipment to the incoming Secretary.
20. Assume the responsibility for all ABFO equipment issued to you. Send correspondence as directed by appropriate authority or in compliance with ABFO bylaws.
21. Record and transcribe all meeting minutes and distribute as prescribed by bylaws.
22. Notify the Forensic Specialty Accreditation Board (FSAB) of the number of active diplomates at the conclusion of the annual meeting AND complete and send an annual report to the FSAB before March 31 of each year. The Annual Report form can be accessed at www.thefsab.org under the downloads link tab.

TREASURER

1. Be familiar with the QuickBooks accounting program.
2. Establish account transfer with current ABFO bank
3. Maintain and balance account.
4. Estimate proposed budget changes as needed.
5. Prepare and mail annual fee statements and recertification notices to the diplomates. Send out the **first** fees statements dated **July 1**. Send out a **second** fee statements if needed dated **September 1**. Send out a **third delinquent** fees statements and penalties certified mail return receipt requested if needed dated **November 1**. This third statement shall state that the action to revoke certification is now in process and that the action to revoke the individual's ABFO certificate will be voted on at the next annual meeting of the BOD in February unless the fees and appropriate penalties are received prior to the next annual meeting.
6. Notify the Examination Committee of application, test and re-test fee payments.
7. Monitor AAFS activity and administrative fees.
8. Prepare treasurer's report for the Executive Committee meetings and Board of Directors' meeting.
9. Monitor bond and recommend changes as needed.
10. Attend Executive Committee meetings and annual meetings.
11. Reimburse Diplomates for ABFO expenses in accordance with the ABFO Travel Policy.
12. Pay appropriate expenses incurred for ABFO business.
13. Be familiar with the duties of Vice President, President, and President and be willing to commit to serving in these positions.
14. Notify the Secretary of any address or phone changes.
15. Be thoroughly familiar with ABFO Bylaws, Code of Ethics, Articles of Incorporation, Standards and Guidelines.
16. Transfer all records at the end of the term of office on a disk to the new Treasurer. See that a new "Corporate Resolution" signature document is available for the incoming Treasurer.
17. Serve a two year term.
18. Notify the corporate attorney, AAFS and FSF of new address after taking office.
19. Maintain ABFO pins and distribute and sell at the annual meeting.
20. Collect funds for ABFO Diplomates dinner. Keep track of attendees and guests.
21. Chair the Ad Hoc Budget Committee for the two (2) years as treasurer.
22. Send financial information to ABFO corporate accountant for filing of annual tax return.

Note: As a nonprofit Corporation, the Internal Revenue Service does not require a tax return as long as our annual revenues are usually \$24,000.00 or less. The Treasurer should monitor the level of gross receipts annually and seek the advice of an accountant familiar with nonprofit corporate tax returns, should they begin to exceed this level. The IRS tax status of the ABFO is a 501(c)6 organization.

ABFO FEES:

Application & Written Examination Fee = \$400.00

This **fee** must be sent to the ABFO Treasurer. 2017-2018 Treasurer is Roger Metcalf, DDS: Treasurer@abfo.org. Make payable to the ABFO in USA funds

The **completed** application in **digital format** must be sent to the Certification and Examination Committee Chairman. 2017-2018 Chairman is Ned Turner, DDS: C&EChair@abfo.org

First Time Practical Examination Fee = \$1000.00

This fee **must** be paid by December 1st following the candidates are notification of their “candidate” status. This fee is nonrefundable except for medical or other catastrophic reasons, in which case \$900 will be refunded pending Certification and Examination Committee review. Send fee to the ABFO treasurer made payable to the ABFO in USA funds.

Practical Reexamination Fees: Part II-A or II-B = \$250 each; Part III = \$500.00

These fees **must** be paid by each candidate by December 1st if a candidate is **retaking** a portion of the practical certification examination (Part II-A; II-B and/or III). A candidate may **retake** the practical portion of the certification examination **twice**. Or a total of three (3) attempts are permitted before he/she must reapply with a completely new application. Send fee to the ABFO treasurer made payable to the ABFO in USA funds.

Recertification Fee = \$150.00

This fee **must** be paid once every five (5) years for an ABFO diplomate to remain certified in forensic odontology by the ABFO. As part of the recertification process, Diplomates will be notified of who and where to send the recertification fees to prior to taking the recertification examination. Send fee to the ABFO treasurer made payable to the ABFO in USA funds.

Annual Dues Fee = \$200.00

This fee **must** be paid each year by active diplomates of the ABFO to maintain their diplomate status in the ABFO. Diplomates will receive a dues invoice dated on or before July 1st. This invoice **must** be paid within ninety (90) days of the date of the invoice. Send fee to the ABFO treasurer made payable to the ABFO in USA funds.

ABFO Digital Image Series:

A new DVD Image Series will be produced every five years and sold on a sliding cost scale. This cost is to be determined and will be published on the ABFO website each year, but it will likely be \$450 for the first year

Send fee to the ABFO Treasurer, made payable to the ABFO in USA funds.

Travel Policy

Revised December 12, 2008

The Executive Committee shall review and make the final determination on all expenses that do not follow the following guidelines for reimbursement. Also, any questions about expenses from the Treasurer shall also be reviewed as necessary. The most cost effective way of conducting meetings will have priority over location, specific dates or other issues.

This policy shall apply to Executive Committee, ABFO examinations and all special committee meetings that have been previously approved.

Reimbursable expenses shall be limited to: hotel, meals during the meeting, taxi and/or shuttle, airport parking, dinner the night before the meeting and breakfast the day after the meeting.

The Fall EC meeting shall be held on a Saturday with expenses being paid for following a Friday arrival and Sunday departure.

Receipts are required for all reimbursable expenses in order to receive payment from the ABFO Treasurer.

Only coach airfare is reimbursable. Any itinerary change or late fees are to be paid for by the attendee.

Sharing of lodging rooms is encouraged but not required.

Due to the changes in location of meetings, a per diem will not be instituted at this time.

Alcohol will not be a reimbursable expense.

ABFO diplomates will be responsible for any expenses incurred by a spouse or significant other.

Travel and lodging arrangements are the responsibility of the attendee and should be made to fit within the travel policy and guidelines.

Any ABFO member attending a meeting without an invitation shall pay for all associated expenses.

The Executive Committee **MUST** preapprove payment of expenses for attendance by non Committee members at Committee meetings not held in conjunction with the AAFS Meeting.

The expenses for invited guests, speakers or non-ABFO members shall be handled on a case by case basis prior to the commencement of the meeting and established by the ABFO Executive Committee.

This policy shall be reviewed on a regular basis and any necessary changes will be made.

The Executive Committee will approve funding for travel, lodging and meeting expenses for the ABFO's President Elect to attend one foreign forensic science meeting each year. The amount of funds would be approved by the BOD each year. The President Elect will be required to present a report to the membership and will be encouraged to actively participate at the meeting with a presentation.

Application Protocol for ABFO Research Funding

Purpose: A goal of the ABFO Research Committee is to encourage and stimulate investigation and research in forensic odontology and related areas. For example appropriate topics for investigation would include: dental identification; bitemark investigation; photographic, radiological, and other imaging techniques; oral and dental aspects of child abuse; dental malpractice and professional negligence; forensic odontology demographics; business aspects of forensic odontology practice; forensic philosophies; etc. Methods may involve: a literature review of a topic that applies to forensic odontology; collection and study of dental, oral, or bitten tissues to quantitative a parameter of interest; collection of information from surveys to answer questions in forensic odontology; and/or collection of data from experiments performed in a research laboratory which pertain to forensic odontology. Funding for projects requiring budgets of \$500 or less is available.

Guidelines and Requirements: The project proposed by the applicant should be well derived, with the likelihood that it could be completed in about one year. The project may be carried out under the supervision of an ABFO Diplomate by a dental undergraduate student, graduate student, resident or Technician. Any publications should acknowledge the support of the Research Committee of the ABFO. The funds requested in the budget section should total \$500 or less, and award checks will be made payable directly to the principal investigator. A brief, one written report documenting the progress of the work will be required toward the end of the year funded. It is expected that the research results will be reported at an annual meeting of the American Academy of Forensic Sciences and/or in a publication in the Journal of Forensic Sciences. The funding by the ABFO will be appropriately acknowledged.

Format: Please adhere to the format listed below. The proposal should be two or three pages long. Submit the original and one copy. Also copies of pertinent literature references (no more than five) should be submitted along with the application to expedite review.

- 1. Title:** Include the project title, your current contact information. Also, list other participants in the project with their titles and current address.
- 2. Academic and professional biographic summaries:** One paragraph for each major participant to include education, employment, forensic and research experience.
- 3. Aims and significance:** Why is the study important and how will this new information advance the field of forensic odontology? What information will be generated and how will it be used?
- 4. Background Information:** Indicate previous work done by the applicant and others related to this topic. Please include copies of relevant references (no more than five) to expedite the review process.
- 5. Materials and methods:** Briefly describe how you will investigate the problem. Indicate materials, methods, and experimental design, anticipated results and how they will be analyzed. Give sufficient detail to allow the reviewers to evaluate the likelihood that the project will accomplish its specific objectives.
- 6. Timetable:** (one paragraph) Schedule the work plan and expected date of completion.

7. Facilities: (one paragraph) Indicate the resources available to conduct the proposed work. Include such information as lab space if needed, the name of the diagnostic laboratories which will perform required tests, the available facilities for experimental animals, etc.

8. Budget: Itemize each research related expense with approximate cost and final total requested (\$500 or less). Depending on the type of project, the budget may include such items as equipment, library search and photocopying fees, postage for questionnaires, cost of laboratory tests and lab supplies, etc.

(NOTE: Equipment purchased with ABFO research funds will be considered to be the property of the Board, with the grant recipient serving as custodian. This means that after the grant period, other diplomates wishing to make use of the equipment will have reasonable access by applying through the Research Committee.)

Proposals will be reviewed by the Research Committee as received. Because the review process will be conducted by mail, a period of weeks may elapse between receipt of the proposal and the Committee's decision regarding approval and funding. Address proposals and any questions to the chairman of the Research Committee.

Review Criteria: The proposal will be evaluated by members of the ABFO Research Committee according to the general criteria listed below. If specific questions arise during the review process the Committee will contact the applicant.

- 1) Is the problem important to forensic odontology?
- 2) Will the research produce new data and concepts or confirm existing hypotheses?
- 3) Is the experimental design adequate?
- 4) Are the methods for data collection and the procedures feasible?
- 5) Are appropriate controls present?
- 6) Do the methods answer the question proposed?
- 7) Is it likely that the study can be accomplished in the time projected and with the facilities and resources available to the applicant?
- 8) Are all items in the budget justified on the basis of the proposed approach, procedures, and analysis of the items?

6/07

CERTIFICATION AND EXAMINATION INFORMATION

Certification and Examination Committee

Committee Function: The Certification and Examination Committee is established to provide the following functions for the American Board of Forensic Odontology, Inc.:

1. Review and approve the credentials of individuals who wish to be determined qualified (Board Eligible) to challenge the examination given by the ABFO for a Certificate of Proficiency in Forensic Odontology.
2. Review and approve the required documentation by Diplomates of the ABFO, which must be submitted for recertification every five years. Create, schedule, and administer the mandatory Recertification Examination which must be taken at this time to be awarded recertification.
3. Create, schedule, administer and grade the examination which must be successfully challenged to be awarded the Certificate of Proficiency in Forensic Odontology, granted by the American Board of Forensic Odontology, Inc. The case(s) used for any portion of the ABFO examination must have had a verdict rendered at the trial court before being used as examination material.
4. Establish and maintain the application and recertification forms, together with instructions, so that they reflect current information and requirements. C&E Committee will conduct periodic audit of the certification examination.
5. Establish policy on continuing forensic dental education and certify that a specific course is approved for continuing forensic dental education credit. The committee is composed of five Diplomates, elected from a slate of candidates selected by the ABFO Nominating Committee. The term of office is five years. The election takes place at the annual meeting of the Diplomates each February. A new member, alternating every other year between an academician and a clinician, is elected each year to replace the outgoing committee member who has completed a five year term. The committee is chaired by the Diplomat serving the fourth year of the five year term. The immediate past chair remains on the committee for the fifth year to give continuity to the actions of the group and serves as an advisor.

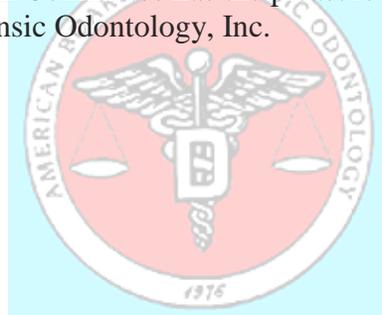
Examination: The committee is responsible for the development, scheduling, administration and grading of the examination given for the Certificate of Proficiency in Forensic Odontology awarded by the American Board of Forensic Odontology, Inc. It is also responsible for the periodic analysis of this examination relative to content, current theory and performance of candidates.

Arrangements for the site, specific dates and notification of the eligible candidates is the responsibility of the Chairman of the committee along with the examination coordinator. They will also arrange for accommodations for the candidates and committee members and their transportation from the housing site to the examination location. Reasonable accommodations are provided upon request, to individuals with disabilities. Immediately following the completion and grading of the examination, as specified by the Constitution and By-laws, it is the responsibility of the Chairman to send to the ABFO Executive Officers and Board of Directors, a list of those candidates challenged the examination.

As a result of the examination, the committee's recommendation for granting or denying certification should be noted for each candidate. Upon the return and tabulation of the response from the Executive Officers and the Board of Directors, the Chairman notifies the candidates to inform them of the outcome, informing those who failed that they have the opportunity to retake the examination if they desire and congratulating those who were successful on their accomplishment and inviting them to attend the next general annual meeting of the Diplomates which is held in conjunction with the mid-February meeting of the American Academy of Forensic Sciences. The names of the candidates approved by the board of directors for certification are transmitted to the Secretary of the ABFO for the preparation of their Certificates of Proficiency.

In addition to advising them of either having passed or failed the examination, the candidate should be informed of any areas of deficiency which resulted in the failure and remedial instructions. Those who fail should be advised of the opportunity to retake the examination and the procedure they are to follow, if they wish to do so.

Presentation of Certificates: The presentation of the Certificates of Proficiency in Forensic Odontology will be made to those who have successfully completed the examination at the next annual meeting of the diplomates. The chairman of the C & E Committee has the pleasure of the presenting the certificates on behalf of the American Board of Forensic Odontology, Inc.



Qualifications and Requirements for Certification

I. GENERAL QUALIFICATIONS:

- A. Applicants must be persons of good moral character, high integrity, good repute, and must possess high ethical and professional standards.
- B. Applicants must possess a DDS, DMD or equivalent dental degree from an accredited institution

II. PROFESSIONAL EDUCATION AND EXPERIENCE

A. Applicants must have:

1. Attended a minimum of four (4) annual meetings of a national forensic/forensic dental organization. No more than one annual meeting can be claimed per year. Additional meetings attended can be claimed for extra point accumulation as described below.
2. Participated in a minimum of two annual programs of a national forensic/forensic dental organization approved by the ABFO Examination and Certification (C&E) Committee. The participation may include presentation of papers, acting as a moderator, panelist on the program, or activities as a chairman or member of a committee of the odontology section. Evidence of these achievements must be documented in a form acceptable to the C&E Committee.
3. Applicants must be currently active and formally affiliated with a medical/legal agency such as a medical examiner/coroner's office, law enforcement agency, insurance agency, federal dental service or mass disaster team for a minimum period of two (2) years.
4. Applicants must have observed a minimum of five (5) complete medico-legal autopsies attested to by the pathologist in charge.
5. Applicants must perform a minimum of thirty two (32) legitimate forensic dental cases.
 - a) A minimum of twenty (20) human identification cases, fifteen (15) of which have resulted in positive dental identification. The applicant must have personally resected, or surgically exposed, the jaws in at least five (5) cases, and personally taken the post-mortem radiographs in at least ten (10) of the cases. ABFO Identification. The ABFO Dental Identification Workshop may count for up to five (5) identifications. (Further details are in the [ABFO Workshops Section](#)).
 - b) Jaw exposures/resections or facial dissection performed in conjunction with a multiple fatality incident (i.e. DMORT, state or military ID team deployment) may qualify toward this requirement only if the required procedures were under the supervision of an ABFO Diplomate and/or the Medical Examiner/Coroner (ME) in charge and are confirmed in writing by this individual. Multiple Fatality Incident (MFI) cases may **not** be included to fulfill the human identification or postmortem radiographic case requirements listed above.

Note: Applicants whose Medical Examiner/Coroner's facility discourages jaw resections or completes jaw resections using non-dental personnel, should either personally seek permission to

complete the required number of resections on appropriate cases, or request mentorship in another jurisdiction/facility where he/she might meet this requirement.

C) Dental Age Estimation (DAE) cases

1. A Candidate shall have been the primary investigator in five (5) DAE cases.
 - a. At least one case of the five cases shall have been a case involving:
 - i. a child (under age 12 years)
 - ii. an adolescent or sub-adult (12- 19 years)
 - iii. an adult (>19 years). The remaining two cases can be from any of the age groups.
2. A minimum of one (1) of the five (5) cases shall be from the candidate's own casework.
3. A minimum of one (1) of the five (5) cases must be obtained by successful completion of an ABFO Dental Age Estimation Workshop or from the ABFO Age Estimation Repository
4. DAE cases from ABFO Age Estimation Workshops (or other approved workshops) may be submitted toward the requirement.
 - a. No more than three (3) DAE cases from ABFO Workshops (or other approved workshops) shall be considered as counting toward the five (5) required DAE cases.
 - b. Only one workshop case from each of the age groups listed in 1.a. shall be considered.
 - c. The candidate must show proof that the case(s) submitted from workshops were completed to the satisfaction of the workshop faculty.
5. DAE cases from the ABFO Age Estimation Repository may be submitted toward the requirement .
 - a. The request for repository cases may not be made until after the candidate has completed one (1) DAE case originating from the candidate's own casework.
 - b. Repository cases must be completed on time and to the satisfaction of the Age Estimation Committee to be considered toward certification application.
 - c. A maximum of two (2) repository cases may be used to meet the minimum case experience requirement in DAE.
 - d. A repository case may not be considered as a case from the candidate's own casework.

D) Bitemark Cases

1. Persons applying for ABFO board certification must provide evidence that they have completed four (4) current or historical bitemark cases in which a minimum of one pattern or patterned injury was analyzed and determined to be a human bitemark with sufficient evidentiary value for comparison.

- a. For these four (4) cases each bitemark with sufficient evidentiary value was compared to the questioned dentition of a minimum of one (1) person of interest.
- b. One of the four (4) cases must have been an ABFO bitemark repository case that includes analysis of the pattern(s) and comparisons to the questioned dentitions of multiple persons of interest.
- c. Having taken and passed an ABFO Bitemark Workshop fulfills the requirements for having completed two (2) bitemark cases and fulfills the bitemark repository case requirement.

These cases should demonstrate the applicant's knowledge, methodology, and capabilities in bitemark analysis. All submitted materials become the property of the ABFO and will not be returned. Cases provided to the potential applicants by the ABFO remain the property of the ABFO. None of these materials shall be shared with any other persons. Except for the preparation of reports to the ABFO these materials must not be duplicated, or published in any form. The materials provided to potential applicants must be returned with the case report(s). In the event the applicant decides to forego application to the ABFO the materials must be immediately returned to the ABFO

E. The remaining three (3) cases can be human identification, bitemark analysis, malpractice/personal injury, human abuse, peer review or age estimation cases.

F. The applicant must have provided sworn testimony in court or through sworn deposition in two (2) identification, bitemark, age estimation or civil litigation cases involving forensic odontology. The applicant must provide copies of the transcripts. The ABFO Civil Litigation Workshop may count towards one (1) case of sworn testimony. (Further details are in the [ABFO Workshops Section](#))).

*Note: All claimed forensic cases must be submitted on the **ABFO Summary of Forensic Cases** form with all appropriate columns completed. The ABFO C&E Committee determines the acceptability of each case. Candidates are encouraged to submit cases in excess of the minimum number of twenty-five (25) in the event some cases are rejected by the C&E committee.*

B. One (1) identification, one (1) dental age estimation and one (1) bitemark case must be ***electronically*** submitted with complete documentation including forensic dental reports, copies of all comparative material (i.e. photographs, radiographs and other appropriate work products applicable to the case). ***The stone study models used in the bitemark cases must also be submitted.*** These should be significant and challenging cases that best demonstrate the applicant's knowledge, methodology and capabilities. ***Cases undertaken as part of ABFO Workshops or the ABFO Test Cases are not acceptable for these two submissions.*** All submitted materials become the property of the ABFO and will not be returned. This requirement shall be subject to waiver by the ABFO only under unusual circumstances such as litigation in progress or military restrictions.

C. Applicants must present additional evidence of forensic dental activity. The activities are calculated on the basis of a point system. A minimum of three hundred fifty (350) points is required. Activities and accomplishments in fulfillment of section A or B cannot be reclaimed for point credits in this section. It is the responsibility of each applicant to submit documentation of all accomplishments claimed for point

credit. The acceptability and ultimate assignment of points will be at the discretion of the C&E Committee. It is advisable that the candidate submit at least enough material to accumulate three hundred fifty (350) points, as follows:

1. Twenty (20) points for each authentic forensic dental case in excess of the twenty-five (25) obligatory cases. The maximum number of cases that will be considered for point credit in this area is five (5), for a maximum of one hundred (100) points.
2. Twenty (20) points per additional court deposition or testimony. Transcripts must accompany the application. The maximum number of transcripts that will be considered for extra point credit in this category is five (5), for a maximum of one hundred (100) points.
3. One (1) point per hour for attendance at a formal, institutional, elective or continuing education course in forensic dentistry; or a formal scientific session at an annual meeting of a nationally recognized forensic science organization. These points are accrued in addition to the mandatory four (4) meetings. Certificates or other verification of course attendance must be submitted. A maximum of one hundred (100) points can be claimed in this area.
4. Twenty-five (25) points for presenting an original lecture or laboratory demonstration at a formal session of a recognized forensic science organization, dental association meeting, or institutional course in forensic dentistry. Abstracts, course brochures or other verification are to be supplied to the C&E Committee for point credit. A maximum of one hundred (100) points can be claimed in this area.
5. Up to fifty (50) points for the acceptance or publication as principal author of a forensic dental article in a refereed scientific journal, electronic journal posting or textbook, with a reprint or copy sent to the C&E Committee. The determination of the point count will be made by the C&E Committee based upon the nature and content of the article and the journal in which it was published. A maximum of twenty-five (25) points will be awarded for a second article or for an article in which the candidate served as a collaborating author, both of which must be accepted or published in a refereed journal or textbook.
6. Twenty (20) points per year for a formal affiliation with a recognized medical/legal agency beyond the mandatory two (2) years. An affidavit from the authorized agent must be included. A maximum of sixty (60) points may be claimed in this category.
7. Forty (40) points maximum for the organization of, or participation in an MFI training exercise or event, mass disaster team membership or symposium. The points are to be divided as follows: twenty-five (25) points for organizing and directing the exercise; one (1) point per hour for attending the exercise, (up to a maximum of fifteen (15) points).
8. Twenty-five (25) points for being the chairperson of an odontology committee, or ten (10) points for serving on an odontology committee of a recognized forensic organization or similar committee of a local, state or federal dental organization acceptable to the C&E Committee. Maximum point count of one hundred (100).

The application and documentation must be sent to the Chairman of the C&E Committee, and the appropriate fees must be sent to the ABFO Treasurer on or before June 1st to be considered for the subsequent examination cycle.

III. ATTAINING STATUS OF EXAMINATION ELIGIBLE

1. Applicants who meet the requirements and qualification set forth in Sections I and II and pay the required non-refundable fees shall, upon acceptable review of the C&E Committee, be granted **Examination Eligible** status. This will allow the applicant to take the comprehensive written examination (Part I).
2. After the C&E Committee has determined that a candidate's application is complete and in order, the candidate has fifteen (15) months from the time of receiving notification of Examination Eligible status to challenge the written examination (Part I).
3. A candidate's status of Examination Eligible does **not** indicate any level of credentialing by the ABFO.

IV. PROCEDURE FOR APPLICATION

- A. Application forms and instructions for their submission can be obtained from the ABFO C&E Committee Chairman or found online at the ABFO website.
- B. Applications must be submitted on the form(s) provided by the ABFO and should be returned to the Chair of the C&E Committee in full compliance with the instructions furnished. The application is not considered complete until the non-refundable application and Part I examination fee of \$400.00 in US funds payable to the American Board of Forensic Odontology, Inc. has been received by the ABFO Treasurer.
- C. The applicant must arrange for submission of an official transcript of his/her academic record from every institution of higher education attended. Such transcripts must be submitted directly by the registrar of each institution to the Chair of the C&E Committee.
- D. Every application must also be supported by letters of recommendation from three (3) persons qualified to judge the applicant's character and professional competence in forensic odontology. Such letters are to be sent directly by the sponsors to the Chair of the C&E Committee.
- E. The completed application, including transcripts, letters of recommendation, application fee and all other material must be received by the ABFO on or before June 1. The Certification and Examination Committee reviews applications and notifies applicants of the status of their eligibility. Eligible candidates will receive general information about the nature of the written portion of the examination followed by specific details. If an application is deemed incomplete, a letter or electronic message specifying the deficiencies will be sent to the applicant. If these can be remedied before July 1 of the same calendar year, the applicant may have the opportunity to take the written portion of the certification examination. In unusual circumstances the Certification and Examination Committee may grant an extension beyond normal submission deadlines. Applicants will be notified electronically when the Chair of the Committee receives the completed application. This notice will confirm that the application is under review. This notice will confirm that the application is under review.
- F. The candidate may take the written portion of the certification examination once Board Eligible status is granted and the candidate is notified. Candidates will take the written portion of the examination at a testing center near their home location. The written portion of the examination will be administered by

Occupational Research and Assessment, Inc. and must be taken on or before November 1 for the candidate to be invited to take the practical portion of the examination.

G. Candidates that successfully challenge the written portion (Part I) of the examination will be eligible to challenge the practical portion of the examination.

H. The practical examination fee of \$1000.00 in US funds payable to the American Board of Forensic Odontology, Inc. is to be paid within thirty (30) days of the time the candidate is notified of their Board Qualified status. This fee is non-refundable except for medical or other catastrophic reasons, in which case all but one-third of the examination fee will be refunded.

V. THE EXAMINATION PROCESS

The C&E Committee will maintain and archive the examination record of each candidate.

A. The Total Certification Examination: consists of three (3) Sections which will be administered according to the following policies:

1. The Part I Examination Section:

- a) Taken at appointed testing center.
- b) Consists of ten (10) Topic Areas and *a candidate must pass each Topic Area.*
- c) Only Topic Areas in which the candidate receives a failing grade must be retaken, up to a maximum of two (2) times. If after three (3) failed attempts (initial test and two (2) re-examinations) to pass all Topic Areas of the Part I Examination Section, the candidate must retake the entire Part I Examination Section.

2. The Practical Examination Section:

- a) Part II-A
- b) Part II-B

The candidate must pass each section of the practical examination.

Note: If a candidate fails to achieve a passing score on Part II-A, Part II-B or Part III, only the section failed must be retaken.

3. The Oral Examination Section (Part III): Pass/Fail

B. The Part I Examination Section – Details:

1. The Part I Examination section will be given at an appropriate testing site (such as a college, university or other commercial site) that is approved by the C&E committee.

2. The Part I Examination Section will be supervised and graded by an outside testing agency chosen by the C&E Committee. The proctors will be blinded as to the identity of the candidates.

3. Candidates will be notified of the results of their Part I Examination Section.

4. Candidates who do not pass the Part I Examination Section may apply to retake the examination on one of the subsequently scheduled test dates. Retesting shall not occur within sixty (60) days of an unsuccessful

challenge. An additional testing fee will be charged to retake the Part I Examination Section and the fee may vary depending on the number of Topic Areas to be retaken.

5. The Part I Examination Section must be passed in a total of three (3) challenges (*the original attempt and two (2) re-examination attempts*) in order to take the Practical and Oral Examination Sections (Parts II-A; II-B and III). The entire Written Examination Section (Part I) must be completed by November 1st in order to take the Practical and Oral Examination Sections. Passing the Part I Examination Section results in the applicant being deemed a “Candidate” for the Practical and Oral Examination Sections.

6. Once candidates have successfully completed the Part I Examination Section they must submit a Practical and Oral Examination Sections examination fee of \$1000 by December 1st in order to challenge the Practical and Oral Examinations.

7. Candidates have twenty-four (24) months following the successful challenge of the Part I Examination Section to challenge the Practical and Oral Examination Sections. After this time period the entire application process must begin anew.

C. The Practical Examination Section (Parts II-A and II-B) – Details:

1. The Practical Examination Section will be given at an appropriate testing site (such as a college, university or other commercial site) that is approved by the C&E committee.

2. There will be a Practical Examination Section in every year that there are two (2) or more qualified candidates requesting examination.

3. The Practical Examination Section will test the knowledge and skills of the candidate in all aspects of forensic odontology.

4. The Practical Examination Section will be developed, supervised, administered and graded by the C&E Committee.

5. The post-examination evaluation of the Practical Examination Section test results will be reviewed by the C&E Committee after each examination to ensure validity, reliability and accuracy of the examination.

6. Candidates who do not pass the Practical Examination Section must retake the portions of the examination not passed within twenty-four (24) months of receiving notice of the unsuccessful challenge.

7. Candidates can challenge the Practical Examination Section three (3) times [the original challenge and two (2) re-examinations]. The Practical Examination Section re-examination fee is \$250.00 per section. The official request for re-examination must be received by the Chair of the Certification and Examination Committee and the fee must be received by the ABFO Treasurer by December 1st.

D. The Oral Examination Section (Part III) – Details:

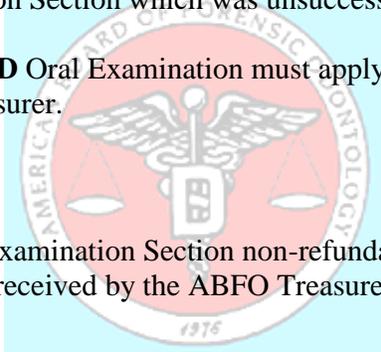
1. The Oral Examination Section will occur at a site and date to be determined by the C&E Committee.

2. The oral examination will consist of an assortment of cases a presented to the candidate by one or more members of the C&E committee. These cases represent various aspects of Forensic Odontology and are not limited to any specific topic.

3. At the Oral Examination Section each candidate will respond to direct questions regarding the cases by one or more members of the C&E Committee.
4. The Oral Examination Section will be administered and graded by the C&E Committee. Post-presentation evaluation of Oral Examination Section assessments will be reviewed by the C&E Committee after each presentation to ensure validity, reliability and accuracy.
5. Candidates who unsuccessfully challenge the Oral Examination Section may repeat the challenge. The Oral Examination Section may be challenged three (3) times [the original challenge and two (2) re-examinations]. The Oral Examination Section re-examination fee is \$500.00. The official request for re-examination must be received by the Chair of the Certification and Examination Committee and the fee must be received by the ABFO Treasurer by December 1st.
6. Candidates who successfully challenge the Oral Examination Section but fail the entire Practical Examination Section (Parts II-A; II-B) will receive credit toward certification for the Oral Examination Section but must repeat all of the Practical Examination Section.
7. Candidates who successfully challenge the Oral Examination Section but fail one Part of the Practical Examination Section will receive credit toward certification for the Oral Examination Section but must repeat *only* the Part of the Practical Examination Section which was unsuccessfully challenged.
8. Candidates retaking the Practical **AND** Oral Examination must apply for re-examination by December 1st and submit the full fee(s) to the ABFO Treasurer.

IMPORTANT DATES AND FEES:

- | | |
|---------------------------------|--|
| June 1 st | Application and Part I Examination Section non-refundable fee of \$400.00 and supporting documentation must be received by the ABFO Treasurer and CE Committee Chairman respectively. |
| July 1 st | Deadline for correction of any deficiencies in application documentation. |
| August 1 st | Notification to applicants by ABFO of Examination Eligible status. |
| November 1 st & Oral | Deadline to successfully pass the Written Examination Section (Part I) in order to take Practical Examination (Parts II-A, II-B and III). |
| December 1 st | Deadline for payment of Practical Examination Sections (Parts II-A; II-B and III) fee of \$1000.00 (non- refundable except for medical or catastrophic reasons, in which case \$900 will be refunded). |
| December 1 st | Deadline for payment of \$250 for re-examination of either Practical Examination Parts II-A or II-B. (\$500 if both Parts II-A and II-B are taken.) |
| December 1 st | Deadline for payment of \$500 for re-examination of Part III Oral Examination. |
| February | Practical Examination Sections (II-A and II-B) must have been taken by the Friday preceding the AAFS Annual Meeting. |



General Provisions Concerning Certification

- 1.** The Board reserves the right to deny certification
- 2.** Certificates granted and issued by the Board may be suspended or revoked for any of the following reasons:
 - a.** A misstatement, misrepresentation, concealment or omission of a material fact or facts in an application or any other communication to the Board or its representative(s).
 - b.** Conviction of a felony by a court of competent authority or of any crime involving, in judgment of the Board of Directors, moral turpitude.
 - c.** Issuance of a certificate contrary to or in violation of any of the laws, standards, rules or regulations governing the Board and/or its certification procedures at the time of its issuance, or determination that the person certified was not in fact eligible to receive such certificate at the time of issuance.
 - d.** Unethical conduct or any other conduct which, in the judgment of the Board, brings the specialty of Forensic Odontology into disrepute.
 - e.** For non payment of annual dues, fees or other assessments imposed by the Board.
 - f.** Failure to recertify every five (5) years.
- 3.** Action to suspend or revoke a certificate may be taken only after thirty (30) days notice of the charges or reasons for such action has been given to the individual concerned and an opportunity has been provided for such a person to be heard as outlined in the laws, standards, rules, or regulations of the Board.
- 4.** Applicants who are denied certification may appeal the decision to the Board of Directors, in writing, within twenty (20) days following the issue date of such notification.
- 5.** Persons holding a valid, unrevoked certificate of qualification issued by the Board are entitled to use the following designations: “Diplomate of the American Board of Forensic Odontology”, “DABFO”, or “Diplomate ABFO”.
- 6.** A certificate of qualification in forensic odontology is valid for a period of five (5) consecutive years and may be renewed in accordance with the recertification program, procedures, standards, laws, rules and regulation established by the Board.
- 7.** Certificates issued by the Board are not transferable. They remain the property of the Board. Every person to whom a certificate has been properly issued shall be entitled to its continued possession unless and until such certificate is revoked.
- 8.** To ensure accurate records, all correspondence to and from applicants should be sent by certified/return receipt requested mail.

American Board of Forensic Odontology, Inc. – ABFO Summary of Forensic Cases
Application for Board Test Eligibility

ID Cases

1. Date of examination **2.** Location (county/jurisdiction) **3.** Agency case # **4.** Were jaws surgically resected or surgical access obtained? Yes or No. **5.** Were postmortem radiographs taken by applicant? Yes or No. **6.** Was a positive ID made? Yes or No. **7.** Signature of Authorizing Agency.

	1 Examination Date	2 Location/Jurisdiction	3 Agency Case #	4 Surgical Resection?	5 X rays?	6 Positive ID?	7 Signature of Authorizing Agent (ME, Coroner, Police)
e.g.	6/1/2014	Madison, AL	14-01587	Yes	No	Yes	Signature
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American Board of Forensic Odontology, Inc. – ABFO Summary of Forensic Cases
Application for Board Test Eligibility

ID Cases (continued) Cases

1. Date of examination 2. Location (county/jurisdiction) 3. Agency case # 4. Were jaws surgically resected or surgical access obtained? Yes or No. 5. Were postmortem radiographs taken by applicant? Yes or No. 6. Was a positive ID made? Yes or No 7. Signature of Authorizing Agency.

	1 Examination Date	2 Location/Jurisdiction	3 Agency Case #	4 Surgical Resection?	5 X rays?	6 Positive ID?	7 Signature of Authorizing Agent (ME, Coroner, Police)
17							
18							
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American Board of Forensic Odontology, Inc. – ABFO Summary of Forensic Cases

Application for Board Test Eligibility

Bitemark Cases Cases

1. Date of examination 2. Location (county/jurisdiction) 3. Agency case # 4. Applicant was the primary investigator? Yes or No.
 5. Case was developed by the ABFO? Yes or No. 6. Bitemark case submitted in its entirety with application? Yes or No.
 7. Signature of Authorizing Agency.

	1 Examination Date	2 Location/Jurisdiction	3 Agency Case #	4 Primary Investigator?	5 ABFO Developed Case?	6 Case Submitted?	7 Signature of Authorizing Agent (ME, Coroner, Police)
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American Board of Forensic Odontology, Inc. – ABFO Summary of Forensic Cases
Application for Board Test Eligibility

Age Estimation Cases

1. Date of examination 2. Location (county/jurisdiction) 3. Agency case # 4. Applicant was the primary investigator? Yes or No.
5. Age Estimation Case Type? Child, Adolescent or Adult 6. Age Estimation case submitted with application? Yes or No.
7. Signature of Authorizing Agency.

	1 Examination Date	2 Location/Jurisdiction	3 Agency Case #	4 Primary Investigator?	5 Case Type?	6 Case Submitted?	7 Signature of Authorizing Agent (ME, Coroner, Police)
1							
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“My signature below authorizes the ABFO or any of its’ officers to verify the accuracy of any information provided in or as part of this application. My signature is confirmation that I agree to adhere to the Code of Ethics of the American Board of Forensic Odontology.”

American Board of Forensic Odontology, Inc. – ABFO Summary of Forensic Cases
Application for Board Test Eligibility

Have you ever been charged with, arrested for, made a plea arrangement for (including but not limited to Nolo Contendre, Alford Plea or any other type of plea arrangement), and/or been convicted of a felony or misdemeanor (excluding minor traffic violations)?

YES _____
Initial

NO _____
Initial

The ABFO Code of Ethics:

As a means to promote the highest quality of personal and professional conduct of its diplomates, the following constitutes the Code of Ethics, which is endorsed and adhered to by all diplomates of the American Board of Forensic Odontology:

- a. Every diplomate of the ABFO shall refrain from any material misrepresentation of education, training, or area of expertise.*
- b. Every diplomate of the ABFO shall refrain from any material misrepresentation of data upon which an expert opinion or conclusion is based.*

Name _____

Address _____

City/State/Zip _____

Signature _____

I certify that the foregoing information is true and I am aware that misrepresentation, concealment or omission of a material fact or facts grants the American Board of Forensic Odontology, Inc. the right to deny eligibility to challenge the certification examination of this board. I also authorize the release of this information to active diplomates of the American Board of Forensic Odontology, Inc.

NOTARIZATION

State of _____)

County of _____)

Personally came before me this _____ day of _____, 20____

The above named _____ to me known as the person who executed the foregoing instrument and acknowledged the same.

(Notary Seal Here)

Notary Public _____

My commission expires _____

Recertification Program

PURPOSE

The purpose of recertification by the ABFO is primarily to promote and encourage the maintenance and improvement of the diplomate's skills and knowledge in the broad area of Forensic Odontology and the related forensic sciences. Additionally, Certificates of Qualification, issued by the ABFO, remain valid for a period of five (5) years and/or until the application for recertification is acted upon. Periodic documentation as evidence of continuing activity in the field is required. By participation in the recertification process the candidate agrees to comply with current and any new policy and procedure changes indicated below.

The application for recertification must be received by the Certification and Examination Committee of the ABFO six (6) months prior to the fifth anniversary of the current Certificate of Qualification. Candidates will begin the recertification process when notified by the recertification chairman of the C&E committee, and applications forms and recertification examination must be completed by Aug 15th. This application shall provide appropriate documentation of satisfactory completion of the requirements described herein.

After notification to the applicant by the Certification and Examination Committee of the ABFO, failure to submit the Application for Recertification as outlined in these guidelines will result in the automatic lapse of the Certificate. Extensions may be granted at the discretion of the Certification and Examination Committee upon timely notice by the applicant of extenuating circumstances.

PROCEDURES FOR RECERTIFICATION

Eligibility for recertification of registered Diplomates of the ABFO will be determined by the Certification and Examination Committee. Recommendations by the Committee for Recertification must be considered and approved or disapproved by the Board of Directors. Eligibility for recertification will be based on the candidate's meaningful participation in forensic activities. This policy for establishing eligibility places a primary responsibility on the candidate to adequately describe their forensic activities.

CATEGORIES OF FORENSIC ACTIVITY

Since the practice of Forensic Odontology covers a broad range of knowledge, not only in dentistry, but in other related forensic sciences as well, these requirements for recertification is meant to reflect the diverse facets of forensic practice. All candidates for recertification must have attended a minimum of fifty (50) hours of continuing forensic dental education during the five years of their current certification. The forensic dental education courses must be approved for credit by the ABFO Certification and Examining Committee. In addition, the candidate is expected to show current involvement in one or more of the following categories of forensic activity:

1. Identification Cases

2. Personal Injury Cases
3. Court Testimony, Depositions
4. Forensic Laboratory Procedures
5. Forensic Pathology and Autopsies
6. Consultative Appointments
7. Continuing Education in Forensic Sciences (50 hours min.)
8. Research in Forensic Sciences and Related Fields
9. Publications in Forensic Sciences and Related Fields
10. Teaching, Lectures, Presentations
11. Bitemark Cases
12. Malpractice, Negligence Cases
13. Forensic Related Appointments, Activities, Offices Held and Meetings

The categories of practice given above are largely self-explanatory and patterned after the general qualifications, professional education and experience originally required of the candidate for Board eligibility. There is no minimum number of "qualification points" required for recertification, although it is expected that nearly all applicants will be active in more than one category, according to the special circumstances of his forensic activity.

Beginning in 2017 and thereafter, the recertification candidate must have attended at least one (1) annual business meeting of the ABFO Diplomates during the five-year recertification period.

FORMAT FOR RECERTIFICATION DOCUMENTATION

The documentation of the previous five years of forensic activities *must* be submitted electronically using the forms located on the ABFO website.

Failure to comply with the above referenced format and instructions will result in the return of the application for correction and the possible delay in recertification.

If this information is kept current as the activity is accomplished the process of recertification will consist of copying the pages and submitting them to the Certification and Examination Committee for their review. If there is no activity in a particular category simply indicate so on the page and submit it with the other categories. Keep in mind that if you keep this information current you will save yourself a lot of time when it is time for you to recertify.

Recertification Examination

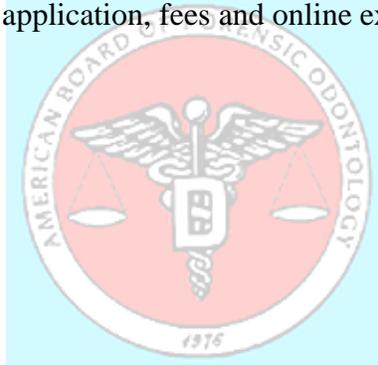
In addition to requiring the diplomates' meaningful participation in forensic activities for recertification, in order to encourage maintenance of an optimal level of knowledge in the broad area of forensic odontology, recertifying diplomates are also required to take the ABFO Recertification Examination. This test was developed to help diplomates personally evaluate their knowledge of the breadth and scope of forensic odontology.

The test will be administered online by ORAinc at www.orainc.com. Prior to this the C&E Committee will provide ORAinc with the list of eligible recertification candidates by March 15th

of the year of their required certification. ORAinc will provide a username and password to each candidate via their exclusive e-mail address of record as listed in the ABFO Diplomate contact information. This test consists of questions/items randomly selected from a pool of test questions covering all major areas in the practice of forensic odontology. After answering each item, the participant will be notified of the correct answer. For security reasons the participant will sign an agreement not to divulge the contents of the Recertification Test to anyone.

Recertification Timeline

- a. The C&E Committee will solicit a list of the year's recertification candidates from the ABFO Secretary prior to the ABFO Annual Meeting each year.
- b. The C&E Committee will notify Diplomate recertification candidates by March 1st each year of their need to recertify and of the process involved.
- c. The diplomates requiring certification will be tested by ORA following the process as outlined by the Recertification Chair.
- d. The due date of the completed application, fees and online exam for ABFO recertification is August 15th.



NAME

Certificate #

Page 1 of 3

ABFO DIPLOMATE RECERTIFICATION DOCUMENTATION

The following format *must* be used when documenting forensic related activities. The documentation must be typewritten or in a legibly printed form. *Failure to comply with the above referenced format and instructions will result in the return of the application for correction and the possible delay in recertification.* If there is no activity in a particular category, simply indicate so on the page and submit it with the other categories.

I. Formal Affiliation(s) Involving Forensic Odontology

Agency	Location (City-State)	Position Held (Title)	Dates Held (From – To)

II. Continuing Education Courses in Forensic Science Taken: (A minimum of 50 hours of forensic-related continuing education every five years is required for recertification)

Sponsor	Location (City-State)	Course Title/Presenter	Dates	Credit Hours

III. Experience in Forensic Odontology

Date	Agency Case #	Forensic Activity	Agency or Employer	Jurisdiction

IV. Court Appearances and Depositions

Case #	Date	Case Name	Jurisdiction	Type of Case	Your Function

*American Board of Forensic Odontology, Inc
Diplomates Reference Manual
Section III: Policies, Procedures, Guidelines & Standards*

V. Committee Assignments

Forensic Organization	Committee Function	Dates (From – To)

VI. Teaching Appointments

Institution	Academic Rank	Field of Study Taught	Dates (From – To)

VII. Research

Area of Forensic Science	Location	Published

VIII. Honors and Awards

Name of Award or Honor	Granting Organization	Date Granted	City-State

IX. Annual Business Meeting *(all Diplomates must attend at least one business meeting of the ABFO during the recertification period)*

Attendance at ABFO Annual Business Meeting	Location	Date

During this respective re-certification cycle, have you been charged with, arrested for, made a plea arrangement for (including but not limited to *Nolo Contendre*, Alford Plea or any other type of plea arrangement), and/or been convicted of a felony or misdemeanor (excluding minor traffic violations)?

YES
Initial _____

NO
Initial _____

ABFO “Ethics Statement”

“My signature below authorizes the ABFO or any of it’s officers to verify the accuracy of any information provided in or as part of this application. My signature is confirmation that I agree to adhere to the Code of Ethics of the American Board of Forensic Odontology and abide by current American Board of Forensic Odontology policies and procedures.

The ABFO Code of Ethics

As a means to promote the highest quality of personal and professional conduct of its Diplomates, the following constitutes the Code of Ethics, which is endorsed and adhered to by all Diplomates of the American Board of Forensic Odontology:

- a. Every Diplomate of the ABFO shall refrain from any material misrepresentation of education, training, or area of expertise.*
- b. Every Diplomate of the ABFO shall refrain from any material misrepresentation of data upon which an expert opinion or conclusion is based.*

I certify that the foregoing information is true and accurate and I am aware that misrepresentation, concealment, or omission of a material fact or facts grants the American Board of Forensic Odontology, Inc. the right to deny recertification and is reason for suspension or revocation of my certification.

Signature: _____ Date: _____

Print Name: _____

Policy on Continuing Forensic Dental Education

I. The purpose of this policy is to establish a forum within the ABFO through which continuing dental education courses in the field of forensic dentistry can be monitored and publicized. This policy addresses only those continuing education courses in the field of forensic dentistry which are offered to the practicing dentist. Pre-doctoral program offerings and postdoctoral program offerings are not to be included.

II. The ABFO recognizes that, as professionals, forensic dentists have an obligation to improve their own knowledge in the field and to foster the understanding of others interested in the field of forensic dentistry by presentation of and attendance at continuing education offerings. It is fitting that the ABFO assume a leadership role in the evaluation of such course offerings, by establishing a committee on continuing education.

III. The Certification and Examination Committee shall be empowered to certify that a continuing dental education course in the field of forensic dentistry is approved for ABFO continuing education credit. Such approval by the committee in no way constitutes an endorsement by the ABFO of theories, materials, and/or methods presented in the course. Rather, approval signifies that the course meets the minimum standards for continuing education in the field of forensic dentistry.

IV. Approval entitles the course to the following:

- A.** The possibility of advance listing in an ABFO publication. Such an advertisement must be requested and paid for in advance. Continuing education offerings not approved by the committee may not be publicized through any ABFO publication or program.
- B.** Approved courses are acceptable by the ABFO Certification and Examination Committee in fulfillment of the educational requirements necessary to sit for the ABFO certifying examination. Credit will be awarded on a one point per course hour basis.
- C.** Approved courses are acceptable by the ABFO Certification and Examination Committee for diplomates applying for recertification.

V. Any continuing education course desiring approval must petition the committee, in writing, prior to the course offering. The petition must include a detailed program listing topics, presenters, any outlines or other handout material, and times. Other supporting documentation concerning the scope of the course and/or the qualifications or experience of the presenters should be included with the petition.

VI. Credit, if awarded, will be established at a level of one point per 50 minute classroom hour of instruction.

VII. A continuing education course which is offered on a regular and continuing basis, and which has been attended by one or more members of the committee in the past, may be approved through a petition filed before the next scheduled offering. Such approval, if granted, shall remain in effect for future course offerings which are not substantially altered in content.

VIII. A continuing education course offered by a university, a state dental society, or other regional or national dental organization may also seek approval through a petition filed prior to its scheduled offering.

IX. All continuing education courses accepted by the ABFO for credit for certification and or recertification, including those presented by Diplomates of the ABFO, will be vetted by the Examination and Certification Committee.

X. All other continuing education courses may only be granted approval based upon timely petition and a decision of the committee to grant approval after a report by a committee member (or designate of the committee) who actually attended the course. However, while such approval is pending, those offering the course may note in their promotional material that ABFO approval has been applied for.

XI. A majority vote of the committee, whether in person, by phone or other electronic communication, or by mail is required for approval. The committee shall consider the presenter's experience and reputation in the field of forensic dentistry, the scope and level of instruction in the course, as well as the nature of the target audience in its decision to approve or rescind approval of the course.

XII. Any ABFO diplomate can request that the committee rescind or deny approval of a course or future course. The requesting diplomate must have attended the course in question and must provide the committee with written reasons for denial or rescission of approval. Upon receiving such a request, the committee will investigate as necessary and will communicate its decision as to the course in question to the diplomates and to the course presenters.

XIII. Expenses incurred by a committee member while monitoring a course shall be the responsibility of the course presenter(s). A decision by a course director to allow an ABFO monitor to attend program without charge shall not be considered a conflict of interest.

XIV. The ABFO shall make a reasonable effort to publicize these continuing education course approval procedures to forensic science groups, dental schools, dental continuing education directors, and state and national dental organizations. The ABFO will make a reasonable effort to distribute a listing of approved courses for publication in the newsletters of forensic science organizations and state and national dental organizations.

(No continuing education course in the field of forensic odontology which is offered after January 1, 1992, can be used to meet recertification or credentialing requirements unless it has been approved by the ABFO Certification and Examination Committee.)

ABFO Workshops

The ABFO has established a series of workshops to provide education and the potential for earning credit towards ABFO certification eligibility. Four workshops are offered in alternating years. The Dental Identification and Civil Litigation workshops are offered in even numbered years and the Dental Age Estimation and the Bitemark Workshops are offered in odd numbered years. Each workshop offers varying amount of credit for its subject, has its own protocols, fee structure and requirements. The workshops are announced on the ABFO website and the credits are awarded by the workshop committees.

Civil Litigation Workshop offers one (1) credit of the two (2) sworn testimony requirements needed for ABFO eligibility.

Dental Identification Workshop offers up to five (5) ID credits of the twenty (20) ID requirements needed for ABFO eligibility.

Dental Age Estimation Workshop offers up to three (3) DAE credits of the five (5) DAE requirements needed for ABFO eligibility.

Bitemark Workshop offers two (2) credits of the four (4) bitemark requirements needed for ABFO eligibility.

ABFO Workshop Policy

Enacted 2-16-2009

Revised 2-24-2017

- 1) For any ABFO Sponsored Workshop offered with potential credit toward the ABFO examination application, the Committee Chair of the appropriate ABFO Committee shall be the lead person.
- 2) The Committee Chair may appoint someone from that Committee to assist in the development and execution of the Workshop.
- 3) Either the Committee Chair or their designee must be responsible for the Workshop and that person may appoint others to assist with the Workshop and form a “Workshop working group”.
- 4) A member of the C & E Committee must be part of the “Workshop Working Group”.
- 5) All fees paid for the Workshop must be submitted to the Treasurer of the ABFO by money order or by check in funds drawn on a US Bank.
- 6) Expenses for the Workshop shall only be reimbursed by the Treasurer if they are submitted by a member of the “Workshop working group”. Reimbursement for expenses requires

receipts for actual expenses and these receipts must be submitted to the Treasurer within 30 days after the conclusion of the Workshop.

- 7) Evaluation of participants for credit must include established written criteria that are measurable. These criteria shall be used by all individuals that are evaluating participants. Evaluation criteria cannot include purely subjective questions (i.e. Should this person get credit for the Workshop?). The Chair of the Committee or their appointed person must evaluate all score sheets for the Workshop and make the ultimate decision as to who does or does not get credit for the Workshop.
- 8) After the determination is made concerning which participants received credit for the Workshop, the Chair of the Committee or their appointed person must contact all participants and review their Workshop performance. This contact should be made by email, mail or telephone. If contact is made by mail or e-mail, there should be an additional offer of discussion of their performance by telephone at the discretion of the participant.
- 9) Registration Deadlines – The registration deadline for ABFO Workshops is September 1st of the year preceding the Workshop. If a Workshop fills up prior to the deadline, it will be closed out early. However, this deadline may be extended at the discretion of the Workshop chair or his/her designee.
- 10) Cancellations/Refunds – Once an individual has registered for a Workshop (submitted payment), there will automatically be an administrative fee of \$100 for any cancellation and/or request for a refund of fees paid. This amount will be subtracted from any fees paid. In addition, if 2 months have passed since the registration deadline (including early registration closeouts), the refund amount will be ½ of the fees paid less the administrative fee of \$100. e.g. \$400 registration fee - \$100 administrative fee = \$300/2 = \$150. Any cancellations that occur in the year of the Workshop (January 1st or after), will receive no refund.
- 11) Confidentiality of Workshop – All materials associated with Workshops (materials provided to or generated by participants or Workshop Committee members) become the property of the ABFO and may not be used without the permission of the ABFO Board of Directors according to Section II, Article IV, Section 1a. of the ABFO Diplomates Reference Manual
- 12) Appeal of Workshop credit decision – All decisions of the Workshop Committee members concerning any credit given (toward ABFO examination application requirements) for a Workshop is final and may not be appealed.
- 13) Acceptance of ABFO Workshop Policy – All individuals who register for any ABFO Workshop must sign and return a written acceptance of these policies.
- 14) Any cases used for an ABFO workshop must have had a verdict rendered at the trial court before being used as workshop material.

ABFO Repositories

The ABFO shall establish repositories of bitemark and dental age estimation cases which may be used by persons requiring such cases to help attain credits towards ABFO board eligibility. The repositories will be maintained by the Bitemark and Age Estimation Committees and distributed for a fee, to potential ABFO candidates.

The Age Estimation Committee shall establish and develop a repository of DAE cases. Cases from this repository may be provided to qualified candidates who request them at a fee of \$75 per case.

- A. The request for repository cases may not be made until after the candidate has completed one (1) DAE case originating from the candidate's own casework.
- B. Repository cases must be completed on time and to the satisfaction of the Age Estimation Committee to be considered toward certification application.
- C. A maximum of two (2) repository cases may be used to meet the minimum case experience requirement in DAE.
- D. A repository case may not be considered as a case from the candidate's own casework.

The Bitemark Committee has established a Bitemark Repository of digitized bitemark cases including 3D scans of dental models, 2D scans of other wax exemplars and images. Cases from this repository may be provided to qualified candidates who request them from the CE committee at a fee of \$100 for each case.

- A. Candidates, who have satisfied all of the requirements to challenge the ABFO certification examination other than the number of bitemarks, may apply to the Certification and Examination Committee to be sent a bitemark case.
- B. The Certification and Examination Committee will evaluate the application of the candidate and if approved, the candidate will submit \$100.00 (U.S. funds), to the Treasurer of the ABFO. The custodian of the repository will then send the case to the candidate.
- C. The candidate will have sixty (60) days to complete the evaluation and submit back to the Bitemark Repository all the materials sent to them as well as a written report that follows ABFO guidelines relating to bitemark analysis, terminology, and report writing. The guidelines are updated periodically and the current information is published in the Diplomates Reference Manual and available on the ABFO website. www.abfo.org
- D. The custodian of the Bitemark Repository will forward the report to the Certification and Examination Committee. They will evaluate the report. In order to receive credit the candidate must minimally;

1. Follow the ABFO guidelines on report writing.
 2. Offer an opinion as to whether each patterned injury examined contains sufficient evidentiary value to proceed. If yes offer an opinion as to whether each patterned injury is or is not a human bitemark using ABFO terminology.
 3. Use appropriate ABFO published terminology in associating a suspect to the patterned injury.
 4. Associate or exclude all suspected biters [when possible] using ABFO terminology.
- E. The Certification and Examination Committee upon completion of their review will notify the candidate in writing 1) That they will NOT receive credit for their evaluation or 2) They will be issued a certificate of completion crediting them with one Bitemark case toward satisfying the requirements to challenge the certification examination. It will be the responsibility of the candidate to retain the certificate(s).

Scientific Methodology Review

One of the American Board of Forensic Odontology's objectives is to improve the quality of its science.

1. Requirements for problem solving using the scientific method
 - A. The problem to be solved must deal with the natural realm involving natural conditions and events.
 - B. The problem must be clearly defined and sufficiently limited in scope so that a hypothesis and a prediction can be developed.
2. Experimental Design Requirements
 - A. Problem defined
 - B. Hypothesis developed
 - C. Prediction made
 - D. Data collected
 - E. Evaluate data in light of hypothesis and prediction
3. Important Definitions
 - A. Hypothesis: a tentative explanation to account for an observed condition or event.
 - The hypothesis must be an explanation for the defined problem.
 - The hypothesis must be testable: requires that evidence (data) can be collected to support or refute the hypothesis.
 - B. Prediction: an outcome or consequence that will result if the hypothesis is accurate. Probabilities can also be assigned based on the likelihood that the event will occur. Depending on the data available, statistical analysis can be performed to assign confidence intervals to the strength of the prediction.
 - C. Variable: generally described as anything that can potentially change (or actively be changed by the investigator) for experimental purposes. When all variables have been identified, the investigator establishes the procedures for carrying out the experiment. In biological systems, investigators must sometimes analyze data collected from observing natural phenomenon when knowledge of multiple variables is not always possible.
 - D. Bias: to prejudge or form an opinion before all the facts are known. A definition commonly found in the medical literature is "a process at any stage of inference tending to produce results that depart systematically from true values." (Murphy, *The Logic of Medicine* Baltimore: John Hopkins University Press. 1976)
 - Rarely, an "expert" might develop an opinion in spite of factual information. An example would be "expectational bias" or diagnostic suspicion bias" when an investigator expects to find a certain outcome, then he/she intentionally or unintentionally finds the expected outcome.
 - Even with the best of intentions, the investigator can introduce factors that predetermine the outcome of the investigation. For example, a consultant who consciously or unconsciously has his/her opinion influenced because he/she believes that the referring agency is "always right."

- A worst case scenario is the consultant whose opinion is affected by remuneration. These persons are frequently referred to as “hired guns.” The consultant is anything but neutral, impartial or objective
- Another term frequently seen in the literature is “previous diagnosis bias.” This type of bias could be seen when a “second opinion” consultant allows a previous diagnosis (opinion) given by the first consultant to influence the second consultant’s opinion. This type of bias could occur when you know and respect another consultant’s work and have that variable influence your opinion. It can also happen the other way - if you do not respect another “expert” or have had disagreements in the past, those previous experiences could knowingly or unknowingly influence your opinion.
- Whereas self-confidence is important, consultants can be “biased” toward believing their own opinion is the only acceptable opinion, refusing to acknowledge that an opinion differing from theirs can have value. An over inflated ego can interfere with sound judgment. Without proof to support the hypothesis, the philosophy of “experience equal expertise” has no scientific validity.
- Odontologists must scrupulously avoid all forms of bias.

E. Blinding: the process of assessment of raw data or information without prior knowledge of potential outcomes.

F. Validity: the ability of the test (hypothesis) to determine or detect that which you are testing. For example, flipping a coin may give you the right answers half of the time if there are only two possible outcomes for what you are testing. For instance, we could assign a decision on a bitemark case by mandating: heads=yes, the suspect’s teeth left that mark; tails=no, the suspect’s teeth did not leave that mark. Even though he/she will be right half of the time, an odontologist using that technique to form an opinion is incompetent and unethical

G. Sensitivity: the ability of a test to detect the true positives.

H. Specificity: the ability of a test to detect the true negatives.

I. Utility: the relative risks and benefits of a test or procedure. A test that has a high probability for a false result has low utility especially if the risks are high and the benefits low. For instance, the utility of bitemark analysis is based on whether the legal system is better off with it or without it.

J. Reproducibility: if the study is reproducible, another investigator testing the original hypothesis using the same parameters will arrive at the same (or very similar) conclusions.

K. Reliability: the consistency between measurements in a series of tests. Remember that the instruments used are only as accurate as the investigator using them.

L. Gold Standard: a test that is generally accepted as the most accurate of available tests. Also called a “reference test” that can be used as a comparison for any new test.

Suggestions for Effective Review of the Bitemark Literature, Evaluating Professional Presentations and for Assessing Abstracts

Be Skeptical:

- When reading the literature, check the journal, the title, the authors, the data and the conclusions. Carefully examine the materials and methods. Look closely at the experimental design.

- When reviewing an article, check the references cited. Are the references correctly cited? Are the cited articles, recent (if the technique hasn't been tested and used in 50 years, there is probably a good reason for it), relevant and reliable? Have the authors done only a “key word search” and created a long list of references that when carefully examined do not support their assertions.

- The data should be meticulously examined. Question the validity of descriptive and inferential statistics. If a statistical analysis is not presented, lower your level of belief. Understand that the statistical analysis is only valid for the population studied; the conclusions presented may not be valid for another population. Carefully examine the study sample size. The number of cases studied or the size of the population (identified by the letter “n”) should be carefully examined. If the data presented is supported by an n=1, be very skeptical. It is extremely rare that any conclusions can be drawn from this sample size. After reviewing significant numbers of articles, Sacket et. al. and Yancey have shown that most published articles have little or no value. Even the most highly respected, refereed professional journals can publish invalid information. The chances are that the author(s) of the article you are reading have drawn at least partially invalid conclusions.

- If you attend an oral presentation, ask that the presenter show the raw data. Equally important, if you don't see what the presenter is attempting to show in the photographic slides, radiographs, etc., ask the author to show it again - preferably in a public forum at the time of the presentation. If you could not see what the presenter is offering, it's likely that no one else could either. If representation/clarification is not convenient, ask to see the data in private. If you are not allowed to carefully scrutinize the evidence, withhold belief.

- Suspend judgment on a test, technique or device until you have carefully examined all potential outcomes. If it appears “too good to be true”, it most likely is.

Beware of assertion without documentation:

- When reading case reports, remember that most case reports have relevancy for only that specific case. The reader should always remember the validity and statistical significance of n=1. Extrapolating the data from that specific case to other separate cases

is probably invalid in most instances unless there is proof that there is reason to horizontally integrate the data. Assertion without documentation, (“My opinion is correct because I’m the authority!”) is very common in bitemark articles and oral presentations. Making claims that have no scientific basis demonstrates the incompetence of the author(s). Beware of the “expert” who says “the evidence is there because I say it is there.”

- Remember that although the conclusions drawn may be correct, the process by which the conclusion was reached might not be scientifically valid (remember the example of the tossed coin). Or as they say in Texas, “Even a blind hog occasionally finds an acorn.” Some odontologists believe that because they may have been “right” in the past that they will always be “right” in the future. “I was right therefore I am an ‘authority’.” It is wise to remember that a consultation with an “authority” is not necessarily a consultation with science. A long list of credentials does not necessarily equate with credibility or accuracy.

- No author should believe that their assertions are correct because no one publicly questions or contradicts the presented material. For any number of reasons, it is not unusual for oral presentations to go unquestioned. It is common for the presenter to show only the data supporting the presenter’s hypothesis. Data that does not support the hypothesis can be selectively eliminated or kept private. When data or cases cease being reviewable in the public domain, that data loses all scientific credibility.

Beware of consensus opinions developed by a committee:

- Committees can be “stacked” with persons who are likely to support what they believe to be conventional wisdom. The committee opinion may not be based on science, but on the relative assertiveness of the various committee members. Carefully examine the credentials, publications and contributions of the individual committee members prior to accepting the statements proffered by the committee. If there are dissenting opinions from individual committee members, review the reasons for disagreement.

Summary of Scientific Reasoning Principles:

- Collect all the relevant information you need.
- Use the information collected. Don’t selectively ignore evidence or place unwarranted credence in unsound or irrelevant information.
- Don’t allow your opinion to be contaminated by “unblinding.” Don’t be biased. Maintain your impartiality.
- Use your knowledge effectively when making interpretations, drawing inferences or promulgating an opinion.

REFERENCES FOR THE EVALUATION OF LITERATURE

[1] Bailar JC, “Science, Statistics, and Deception,” *Annals of Internal Medicine*; 1986; 104: 259-260.

[2] Sacket DL, Haynes BR and Tugwell P., *Clinical Epidemiology: A Basic Science For Clinical Medicine, 1989*. Little and Brown and Company. Boston, Toronto and London.

[3] Schor S, Karten I., “Statistical Evaluation of Medical Journal Manuscripts,” *JAMA: 1986; 140: 472-474*.

[4] Riegelman RK and Hirsch RP., “Studying a Study and Testing a Test: How to Read the Medical Literature,” 1989. Little, Brown and Company. Boston, Toronto and London.

[5] Yancey JM., “Ten Rules for Clinical Research Reports,” *The American Journal of Surgery, 1990; 159: 534-538*.

07/95

Definitions of Guidelines, Standards and Policies

Guidelines:

- Suggested but not mandatory
- Recommended, but not required

Standards:

- A model to be followed; establishes protocol; a benchmark
- Strictly defined and to be followed by all based on its correctness
- Compulsory minimal level of practice
- More restrictive than guidelines; more enforceable

COMMENT: a failure to follow a standard may be defensible if it can be justified by proof that the standard is not worthy or that the departure is equivalent.

Policy:

- A predetermined, selected and planned prescription of conduct.
- Policies define beliefs and philosophy
- A principle, plan, or course of action as pursued by an organization

06/09

Guidelines and Standards Amendment Protocol

In order to provide an orderly and generally agreed upon alteration of any forensic odontology guideline or standard established and adopted by the American Board of Forensic Odontology, the following protocol is the method by which any alterations, modifications, additions and/or deletions are to be made to published accepted guidelines or standards of this organization.

Protocol

- 1.** The proposed change is to be submitted, in writing, to the President of the ABFO and the Chairperson of the Strategic Planning Committee (SPC) on or before July 1st in the year prior to the next annual meeting at which it will be considered for adoption.

- 2.** The SPC members will study the proposed revision and report its recommendations to the Executive Committee (EC) on or before September 1st in the year prior to the next annual meeting at which it will be considered for adoption. The EC, after considering the recommendations will submit the recommendations to the Board of Directors (BOD) for a vote. In the event the SPC fails to report their recommendations, the Executive Committee may elect to

continue the adoption procedures in consultation with and approval by a majority of members of the BOD.

3. If approved, the Executive Committee will inform the Diplomates by mail or email of the proposed change(s), the SPC recommendations and the date of the annual meeting at which the proposal will be considered and voted upon by the membership. This written announcement must be made by November 1st in the year prior to the next annual meeting at which the issue(s) will be considered.
4. The proposed change(s) shall be on the agenda of the meeting of the Board of Directors and Diplomates.
5. The proposed change(s) shall be considered at the annual meeting of the Diplomates provided the above referenced requirements have been met. The change(s) can be proposed for consideration during the meeting at the time of the report of the SPC or as new business as directed by the presiding officer.
6. The adoption of the change will require a majority vote of all certified Diplomates or a two-thirds (2/3) majority of the Diplomates in attendance, whichever is less. If the latter, a quorum is required.
7. The results of the action of the Diplomates shall be reported to the Diplomates at large by April 1st of the year in which the changes were adopted

Policies and Procedures Amendment Protocol

Policies and procedures may be amended by the following:

1. The proposed policy or procedure change(s) shall be submitted to the President and the chair of the SPC
2. After consideration and comment by the SPC the proposal(s) will be forwarded to the EC.
3. The EC will forward the proposal(s) to the members of the Board of Directors for their review.
4. After a minimum review period of 30 days, an affirmative vote by a simple majority of the BOD at a regular or special meeting or by mail or e-mail ballot shall validate the proposed changes

ABFO Bitemark Methodology Standards and Guidelines

Standards for Human Bitemark Analytical Methods

1. All Diplomates of the American Board of Forensic Odontology are responsible for being familiar with and utilizing appropriate analytical methods.
2. All evidence received or collected must be reviewed. The analyses performed and the results of those analyses must be included in the final report.
3. New analytical methods should be scientifically sound and verifiable. New analytical methods should be used in addition to existing accepted techniques listed in these guidelines.

ABFO Standards for "Bitemark Terminology"

1. Terms assuring unconditional identification of a perpetrator, or identification “without doubt”, are not sanctioned as a final conclusions in an open population case.
2. Terms used in a manner different from the guidelines should be explained in the body of a report or in testimony.
3. All forensic odontologists certified by the American Board of Forensic Odontology are responsible for being familiar with the standards set forth in this document.

Methods to Document Human Bitemark Evidence

Bitemark, Bite Mark, Bite-mark

The meaning of the terms is clear and there is no need for the ABFO to endorse a particular form.

1. Bite Site Evidence

General Considerations - The Forensic Odontologist is often not involved in the initial examination and collection of the bitemark evidence. This does not preclude the ability of the

Forensic Odontologist to render a valid opinion. The methods listed below are not intended to be an all-encompassing list of documentation methods.

A. Orientation photographs should be taken prior to the collection of any bite mark evidence.

B. Saliva Swabs of Bite Site

- Method - The double swab technique will maximize the possibility of recovering useful biological evidence from a bite mark site. The first sterile swab is moistened with sterile distilled water. Using medium pressure wash the surface of the bite site with the sterile moistened swab for 7–10 seconds. The dry sterile swab is immediately used with light pressure to collect the moisture left on the surface by the first swab. The two swabs must be air-dried at room temperature prior to submission to the laboratory, or inserted into a sterile container that allows air to circulate during storage.
- Storage - The swabs should be submitted for analysis as soon as possible. They should be kept at room temperature if submitted within 4–6 hours, or refrigerated (not frozen) if stored longer than 6 hours.

C. Photographic Documentation of the Bite Site

- The bite site should be photographed using digital photography. The photographic procedures should be performed by the forensic odontologist or under the odontologist's direction to encourage accurate and comprehensive documentation of the bite site.
- Orientation and close-up photographs should be taken.
- Images recorded should be of high quality
- Photographs of the patterned injury should be taken with and without an ABFO #2 photometric scale in place.
- When the scale is used, it should be on the same plane as and adjacent to the patterned injury. The camera should be 90 degrees to the plane of the scale.
- In the case involving a living person or a person recently deceased, it may be beneficial to obtain serial photographs of the bite mark over time.
- Infrared, ultraviolet and alternate light photographs maybe taken when indicated in addition to conventional visible light photographs.
- Video imaging may be used *in addition* to digital photography.

D. Impressions

- Impressions should be taken of the surface of the bite mark when three-dimensional properties are present. The impression materials should meet American Dental Association specifications for intraoral use and should be identified by name in the report.

- Suitable support should be provided for the impression material to accurately reproduce body contour.

E. Tissue Samples

- In the deceased, the bite site may be excised and preserved using proper stabilization techniques prior to removal. Proper authorization should be obtained before excising any tissue.

2. Evidence Collection of Suspected Human Dentition

Prior to collecting evidence from suspected biters, the odontologist should ensure that appropriate search warrant, court order or legal consent has been obtained. A copy of these documents should be retained as part of the case record. The court document or consent should permit collection of the evidence listed below:

A. Dental Treatment Records

- Whenever possible the dental records of the suspected biters should be obtained.

B. Photography

Images acquired should include:

- Extraoral images
 - Full face
 - Profile

Intraoral photographs with retractors and mirrors:

- Anterior view in centric occlusion
 - Anterior view with incisal edges slightly opened ,
 - Anterior view with mandible protruded
 - Anterior view demonstrating maximal open with scale in place
 - Lateral views, both left and right side
 - Occlusal view of each arch
 - Additional photographs that may provide other useful information.
 - If inanimate materials are used for test bites, the results should be preserved photographically.
- Video imaging may be used to document the dentition *in addition* to digital photography.

C. Extraoral Examination

The extraoral examination should:

- Document significant soft and hard tissue features that may influence biting dynamics.
- Document temporomandibular joint function, noting any deviations in opening or closing.
- Document measurement of maximal opening of the mouth.
- Document the presence of facial scars, evidence of surgery, and the presence and nature of facial hair.
- Document facial asymmetries, muscle tone and balance.

D. Intraoral Examination:

- The periodontal condition should be noted with particular reference to mobility of teeth.
- Fractured and missing teeth should be documented.
- Any intraoral anomaly should be documented, including tori, bifid tongue, as well as tongue or lip piercings.

E. Impressions

Whenever feasible, at least two impressions should be taken of each arch, using materials that meet American Dental Association specifications and are prepared according to the manufacturer's recommendations, using accepted dental impression techniques.

- The interocclusal relationship should be recorded.
- If removable prosthetics are noted, impressions should be taken with and without the prosthesis in place.

G. Sample Bites

Sample bites should be recorded using appropriate American Dental Association materials, such as Aluwax or Coprwax.

H. Study Casts

- Master casts should be prepared and labeled using American Dental Association approved Type III stone prepared according to manufacturer's specifications, using accepted dental techniques. Other highly accurate resins may be used for model production.
- Additional casts may be poured from the original impression and labeled to indicate each additional pour if the impression material used was polyvinylsiloxane and/or polyether American Dental Association approved materials. If the original impressions were taken

in alginate or other similar materials, duplicate casts may be created from an impression of the master cast. Duplicate casts should be appropriately labeled and a record of which master cast was utilized to produce the duplicate.

- Master casts should not be altered.

I. Saliva Samples

- DNA samples should be collected from all suspected biters.

Human Bitemark Analysis Guidelines

Description of Bitemark

Case data should be documented. These data should include:

1. Identification Data (case number, agency, name of examiner(s), etc.)
2. Location of Bitemark
 - anatomical location or object bitten
 - surface contour: (e.g., flat, curved or irregular)
 - tissue characteristics
3. Injury features (size, shape, presence of abrasions, contusions, avulsions)
4. Other Information as indicated (e.g., three-dimensional characteristics, unusual conditions)
5. Bitemark Description
 - Identification and the orientation of the maxillary and/or mandibular teeth within the bitemark
 - Identification of the midline of the maxillary and/or the mandibular teeth marks
 - Identification of marks made by specific teeth
 - Identification of areas absent of a mark(s) within a dental arch forming the bitemark
 - Identification of features within a bitemark that may indicate rotations, translations, or other anomalies of specific teeth
 - Summary of the features that comprise the nature of the injury in relationship to the teeth that caused the injury

6. Analysis of the bitemark should be completed before any comparison(s) to information from suspected biter(s) is made.

Methods of Comparing Exemplars to Human Bitemarks

1. Overlays

Types of overlays

- Computer generated
- Images of casts printed on transparency film
- Computer generated superimposition of casts over the bitemark

2. Test Bites (wax, Styrofoam, clay, skin, etc.)

3. Comparison Techniques

- Exemplars of the dentition are compared to corresponding-sized photos of the bite pattern.
- Dental casts to life-sized photographs, casts of the bite patterns, reproductions of the pattern when in inanimate objects, or resected tissue.
- All comparisons should include incorporation of the incisal height
- In cases where there is only one suspected biter, the use of a dental lineup is suggested.
- The ABFO supports a second opinion review from another Diplomate in bitemark cases

4. Other Methods Employed For Analysis

- Transillumination of tissue
- Computer enhancement and/or digitization of mark and/or teeth
- Stereomicroscopy and/or macroscopy
- Scanning Electron Microscopy
- Video superimposition
- Histology
- Dimensional

ABFO Bitemark Terminology Guidelines

Component Injuries Seen in Bitemarks

Abrasions (scrapes), contusions (bruises), lacerations (tears), ecchymosis, petechiae, avulsion, indentations (depressions), erythema (redness) and punctures may be seen in bitemarks.

A Characteristic

A *characteristic*, as applied to a bitemark, is a distinguishing feature, trait, or pattern within the mark. Characteristics are two types, *class characteristics* and *individual characteristics*.

Class characteristic: a feature, trait, or pattern that distinguishes a bitemark from other patterned injuries. For example, the finding of four approximating linear or rectangular contusions is a class characteristic of human incisors. Their dimensions vary in size depending upon what inflicted the injury: maxillary or mandibular teeth; and, whether primary or permanent teeth. Moreover, the overall size of the injury will vary depending on the contributor's arch dimension. Thus, a bitemark *class characteristic* identifies the group from which it originates: human, animal, fish, or other species.

Individual characteristic: a feature, trait, or pattern that represents an individual variation rather than an expected finding within a defined group. There are two types:

Arch characteristic: a pattern that represents tooth arrangement within a bitemark. For example, a combination of rotated teeth, buccal or lingual version, mesio-distal drifting, and horizontal alignment contribute to differentiation between individuals. The number, specificity, and accurate reproduction of these arch characteristics contribute to the overall assessment in determining the degree of confidence that a particular suspect made the bitemark (e.g., rotation, buccal or lingual version, mesial or distal drifting, horizontal alignment).

Dental characteristic is a feature or trait within a bitemark that represents an individual tooth variation. The number, specificity, and accurate reproduction of these dental characteristics in combination with the *arch characteristics* contribute to the overall assessment in determining the degree of confidence that a particular suspect made the bitemark (e.g., unusual wear pattern, notching, angulations, and fracture).

Distinctive - This term is variably defined as either rare or unusual.

- Variation from normal, unusual, infrequent.
- Not one of a kind but serves to differentiate from most others.
- Highly specific, individualized.
- Lesser degree of specificity than unique.

Bitemark Definitions

Bitemark:

- A physical alteration in a medium caused by the contact of teeth.

- A representative pattern left in an object or tissue by the dental structures of an animal or human.

Describing the Human Bitemark

A circular or oval patterned injury consisting of two opposing (facing) symmetrical, U-shaped arches separated at their bases by open spaces. Following the periphery of the arches are a series of individual abrasions, contusions, and/or lacerations reflecting the size, shape, arrangement, and distribution of the class and individual characteristics of the contacting surfaces of the human dentition.

Variations:

1. Additional features:

- Central Ecchymosis (central contusion).
- Linear Abrasions, Contusions or Striations
- Double Bite - (bite within a bite)
- Weave Patterns of interposed clothing.
- Peripheral Ecchymosis

2. Partial Bitemarks

3. Indistinct/Faded Patterned Injury (e.g., fused or closed arches, solid ring pattern)

4. Multiple Bites.

5. Avulsive Bites.

Terms Indicating Degree of Confidence That an Injury is a Human Bitemark:

A. *Human Bitemark* – human teeth created the pattern.

- *Criteria:* the pattern demonstrates class and/or individual characteristics of human teeth.

B. *Not a Human Bitemark* – human teeth did not create the pattern.

- *Criteria:* the pattern does not demonstrate class and/or individual characteristics of human teeth.

C. *Inconclusive* – there is insufficient information to reach an opinion whether or not the pattern is a bitemark.

- *Criteria:* class and/or individual characteristics of human teeth are missing, incomplete, distorted, or otherwise insufficient in the pattern.

Terms Used to Relate a Questioned Dentition to a Bitemark:

A. *Excluded as Having Made the Bitemark*

- *Criteria:* the bitemark demonstrates class and/or individual characteristics that could not have been created by the dentition in question.

B. *Not Excluded as Having Made the Bitemark*

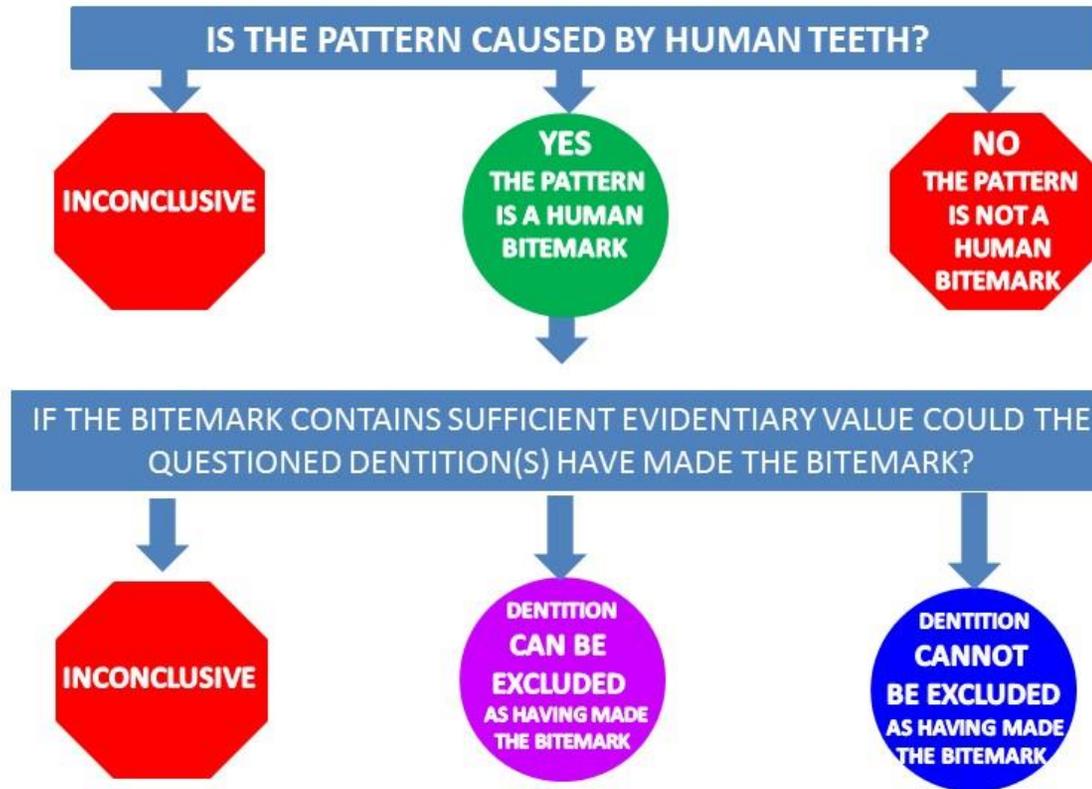
- *Criteria:* the bitemark demonstrates class and/or individual characteristics that could have been created by the dentition in question.

C. *Inconclusive*

- *Criteria:* although the analyst has concluded the pattern is a human bitemark, there is missing, incomplete, or otherwise insufficient information to form an opinion whether or not the dentition in question caused the bitemark.

ABFO Bitemark Case Review Guideline

A case review should be performed by a second ABFO Diplomate. The reviewer will not be required to provide a second opinion (but may do so if he/she wishes), but will provide an administrative review of the analysis that was done. This review should determine if the analysis and report adhered to the standards, guidelines, methodology and terminology of bitemark investigation as the required by these standards and guidelines.



ABFO Guidelines for Investigative and Final Bitemark Reports

The following ABFO Bitemark Report Writing Guidelines propose a format for written bitemark case reports. These guidelines are suggestions for the form and content of the report. Diplomates may be asked to provide preliminary or investigative reports. Those preliminary reports may follow the same general guidelines without being conclusive in nature.

Reports may be structured into the following sections:

Introduction

This section provides the background information, the “who, what, when, where and why” data related to the case.

Inventory of Evidence Received

This section lists all evidence received by the Forensic Odontologist and details the source of the evidence.

Inventory of Evidence Collected

This section lists the nature, source, and authority for evidence collected by the Forensic Odontologist.

Opinion Regarding the Nature of the Patterned Injury or Injuries

This section states the author’s opinion as to whether the patterned injuries in question are bitemarks, using ABFO terminology. Only one comparative term is used for each opinion in this part of the report.

Methods of Analysis

This section describes the analytic methods used for the patterned injuries determined to be bitemarks.

Results of Analyses

This section describes the results of the comparisons and analyses.

Opinion

This section states the author’s opinion of the relationship between one or more bitemarks and a suspected biter or biters using ABFO Bitemark Terminology. Only one comparative term is used for each opinion in this part of the report.

Disclaimer

Disclaimer statements may be included to convey that the opinion or opinions are based upon the evidence reviewed through the date of the report. The author may reserve the right to file amended reports should additional evidence become available.

ABFO BODY IDENTIFICATION INFORMATION

The importance of timely identification

In the United States, the Medical Examiner or Coroner (ME/C) has the statutory responsibility and judicial authority to identify the deceased. The identification of unidentified living individuals is the responsibility of local, state or federal law enforcement agencies. Although it is ultimately these agencies that certify the identification it is the responsibility of the forensic odontologist to provide their opinion on the identity as it relates to forensic odontology. Those opinions are based on a standardized set of guidelines established by the forensic odontology community and are based on scientific best practices.

The positive identification of an individual is of critical importance for multiple reasons that include:

For unidentified living individuals:

- A positive identification is vital to reunite an unidentified living individual with their family members.

For the human remains:

- A positive identification is vital to help family members progress through the grieving process, providing some sense of relief in knowing that their loved one has been found.
- A positive identification and subsequent death certificate is necessary in order to settle business and personal affairs. Disbursement of life insurance proceeds, estate transfer, settlement of probate, and execution of wills, remarriage of spouse and child custody issues can be delayed for years by legal proceedings if a positive identification cannot be rendered.
- Criminal investigation and potential prosecution in a homicide case may not proceed without a positive identification of the victim.

Scientific Identification

All methods of identification involve comparing antemortem data to postmortem evidence. Although a presumed identification is often established by contextual evidence, ideally, antemortem biometric data of the individual should be obtained and compared to the postmortem evidence to establish a scientific identification. Currently there are five general methods used to identify deceased human remains of which most require a presumptive identification in order to allow for the direct comparison of antemortem and postmortem biometric evidence. The five methods of identification are visual, fingerprint, DNA analysis, anthropologic/radiology and dental comparison.

Visual

A non-scientific method, but is often used when there is little doubt who the individual is, when the remains are not decomposed, and/or the death was witnessed. However changes in appearance from illness, the circumstances of death, (fire, trauma, disintegration, etc.) and postmortem taphonomic effects, (decomposition, mummification, saponification, skeletonization, animal predation/scavenging, insect activity, etc.), may render it unreliable.

Tattoos, scars, piercings, subdermal body modification, and soft tissue abnormalities are useful for visual identification, especially if the tissue is intact. It is important to note, that although personal effects are often found with the remains or at the scene (identification cards, jewelry, cell phones, etc.), they should never be used as the sole means of establishing an identification due to the possibility that these items were exchanged between individuals. However, they may offer important clues for a presumptive identification and assist in obtaining antemortem data on the individual to allow for a scientific identification.

In the future, the potential to establish a large facial image database based on facial recognition data may be possible; however, currently these databases are extremely limited in size. However, even these limited databases could be utilized to establish a presumptive identification and could assist in obtaining antemortem information in order to establish a more scientific basis of identification.

Ridgeology (Fingerprints)

Ridgeology is an expedient biometric method of human identification, especially if the soft tissue of the fingers are intact, an adequate impression or image of the friction ridges can be obtained, and antemortem fingerprint records are available. Burned, decomposed, skeletonized and fragmented remains may be more difficult, if not impossible to image, however, newer techniques have reduced this problem. This method has the advantage of large known national and international databases and does not required a presumptive identification in order to obtain antemortem information.

Anthropology/Radiology

Anthropology, combined with radiology relies on the unique characteristics of the skeleton to compare with antemortem medical imaging and records. Radiographs of skeletal anatomy, bony anomalies, healed fractures; pathological lesions, medical/surgical hardware and implants, or unusual qualities of the skeleton can be used to confirm identification. However, many individuals do not have antemortem skeletal imaging, or the images may not be available.

DNA

Like other biometric methods of identification, DNA comparison relies on access to antemortem data to make a definitive identification. However, unlike other modalities, familial relationship can be established even when antemortem data is not available. In addition, like ridgeology (fingerprints) large national databases are currently being established that can reduce the need for a presumptive identification especially if the decedent has had contact with the justice system. Direct primary and secondary reference samples from the decedent during life are the best sources for identification and indirect DNA reference samples from biological relatives can prove useful in establishing a relationship. DNA testing requires more time, effort, specialized personnel/equipment, and higher cost than other identification methods. The majority of forensic DNA tests are performed on nuclear DNA using polymerase chain reaction (PCR) amplification of the sample with short tandem repeat (STR) typing. Simultaneous analysis of mitochondrial DNA (mtDNA) may be necessary in order to improve the identification process. Forensic DNA analyses for human identification has seen a tremendous implementation since the President's DNA Initiative Program began in 2003. This program has facilitated funding, training, and assistance to ensure forensic DNA reaches its full potential to identify missing persons. From

this program, the National Institute of Justice now provides funding to have DNA analysis done on unidentified remains and family reference samples, at no cost, by the Center for Human Identification at the University of North Texas, or by the FBI. Once the analysis is complete, the profiles (if they qualify) are entered into the FBI's CODIS system (Combined DNA Index System) and uploaded into the National DNA Index System.

Dental Identification

Dental identification of a deceased person is a primary function of forensic odontology. The comparison of a missing person's antemortem dental records/evidence (i.e., written records, study casts, photographs/digital images and radiographs) with the postmortem dental evidence from unknown human remains has long been recognized as one of the most reliable means of positive scientific identification.

Though an individual's dental characteristics will often change during life (dental disease, restorations, extractions, etc.), changes after death are very slow. In fact, the dental condition at death has been shown to last in some cases for centuries.

When there is an alteration in an individual's dental condition that change is in one direction. This was described by Lorton and Langley: "The direction of change of status of a tooth is fixed; that is a tooth cannot have a filling on a surface and then proceed to a state in which there is no filling on that surface. It can only go from having no filling on a surface to a state in which there is one".

Likewise, once a tooth is extracted or otherwise missing, it cannot subsequently be present. This unidirectional change is significant during the verification process and must be considered during any comparison/search process

Forensic odontologists are responsible for identifying unknown human individuals by comparative dental analysis. This process requires comprehensive collection and processing of dental data in order to prove or disprove a human identification.

The forensic odontologist will evaluate and compare the two dental records, the postmortem and the antemortem material. It is their task to determine if the two records were made or could have been made from the same individual. Though most will employ similar techniques and routines, there can be some variation in the way that this comparison is executed. In the end however, for there to be a positive match all inconsistencies within the written records must be explained and distinguishing features must be demonstrable in the hard material evidence, i.e. radiographs, dental models, photographs, etc.

Body Identification Guidelines

OUTLINE

I. Collection and Preservation of Postmortem Dental Evidence:

- A. The Remains - Examination Procedures
- B. Photography
- C. Jaw Resection
- D. Techniques for Dissection/Resection
- E. The Postmortem Dental Record
 - 1. Dental Examination
 - 2. Narrative Description and Nomenclature
 - 3. Dental Impressions
 - 4. Dental Radiology

II. Sources for Antemortem Data:

- A. Local Agencies
- B. State Agencies
- C. Federal Agencies
- D. International Resources
- E. Insurance Carriers
- F. Other Sources

III. Comparison of Antemortem and Postmortem Evidence:

- A. Dental features useful in identification

IV. Categories and Terminology for Body Identification:

- A. Positive Identification
- B. Possible Identification
- C. Insufficient Evidence
- D. Exclusion

Some diplomates may follow alternative techniques that may be equally effective. It is not the purpose of these guidelines to invalidate other methods, but rather to describe methods that a majority of investigators employ.

I. COLLECTION AND PRESERVATION OF POSTMORTEM DENTAL EVIDENCE

The postmortem dental examination is conducted by the authority and under the direction of the coroner/medical examiner or his designee, typically a forensic pathologist. Thus, the protocol for the collection of postmortem dental evidence, particularly decisions to incise the facial tissues for access or resect the jaws, is subject to approval by the regional coroner/medical examiner. The actual procedures to be followed in a dental identification case depend in large part on the condition of the remains (as well as other circumstances of the case).

A. Examination Procedures

1. Visually identifiable body

- Photographs, radiographs, dental charting
- Dental Impressions, as applicable
- Resection by infra-mandibular dissection

2. Decomposed/incinerated body

- Photographs, radiographs, dental charting
- Resection and preservation of jaw specimens, if indicated

3. Skeletonized remains

- Photographs, radiographs, dental charting
- Preservation of jaw specimens, if indicated

B. Photography

Photographic documentation of dental evidence can provide objective data which is often more graphic than the written chart. Photographs (with an accompanying scale) should be taken before and after appropriate cleansing. The ABFO #2™ right angle ruler is recommended. The photographs should be clearly labeled with the case number/name and date. All relevant photographic information should be documented.

1. Recommended Equipment

- Single lens reflex digital or 35 mm. film based camera
- Electronic flash (preferably point flash or ring light system)
- Cheek retractors
- Intra oral front-surface mirrors

2. Film based photography

- Color film (slide and/or print format)
- Black and white film, as required

3. Photographic Views

- Full face, lips retracted
- Close-up view of anterior teeth
- Lateral views of teeth in slightly open position, and in occlusion
- Occlusal views, maxillary and mandibular teeth
- Special views, as required

C. Jaw Section/Resection

Facial dissection and/or jaw sectioning/resectioning, which may be necessary for full access to dental structures are done only with approval of the coroner/medical examiner. Ordinarily, the circumstances dictating decisions to resect are applicable as follows:

1. Viewable Bodies

Restricted opening due to rigor may require:

Intra oral incision of masticatory muscles, with or without fracture of the condyles

Breaking the rigor with bilateral leverage on the jaws in the retromolar regions

Waiting until the rigor subsides

Infra-mandibular dissection with or without mandibular resection

Removal of the larynx and tongue at autopsy may facilitate the visual examination of the teeth and/or placement of intra oral films. Again, the removal of these tissues should only be performed after the autopsy and with permission of the pathologist.

These tissues should either be retained by the pathologist or replaced with the body.

2. Decomposed, Incinerated, or Fragmented Bodies

Jaw resection in such cases facilitates dental charting and radiographic examination.

Careful dissection of the incinerated head, in particular, is required to preserve fragile tooth structure and jaws in situ. Radiographs should be made prior to manipulation of badly burned fragments. Mechanical (or chemical) sterilization of such tissue should be instituted where necessary.

3. Skeletonized Remains

Since the skull and mandible are readily separated from the remainder of the skeleton, resection of the maxilla is not required.

4. Preservation of Evidence

Jaw resection may be indicated in cases in which:

Body parts are to be transferred, with proper authorization, to other facilities for additional examination and testing.

A homicide victim is to be cremated.

There is other valid justification for preservation of the jaw specimens (state mandated law).

D. Techniques for Dissection/Resection

Selected techniques are described below. Other methods may be employed when indicated.

1. Facial Dissection:

Bilateral incisions of the face, beginning at the oral commissures and extending posteriorly to the anterior ramus, permit reflection of the soft tissues for better access.

Infra-mandibular Approach: Bilateral incisions are made across the upper anterior neck and extend to points posterior and inferior to the ears. The skin and underlying tissues are then reflected upward over the lower face thereby exposing the mandible.

2. Jaw Resection:

Stryker Autopsy Saw Method:

The soft tissue and muscle attachments on the lateral aspect of the mandible are dissected away by incisions which extend through the muco-buccal fold to the lower border of the mandible. Lingual attachments are similarly incised to include the internal pterygoid attachments to medial aspect of the rami and the masseter attachments on the lateral aspect. On the maxilla, facial attachments are incised high on the malar processes

and superior to the anterior nasal spine. Stryker saw cuts are made high on the rami to avoid possible impacted third molars. Alternatively, the mandible may also be removed by disarticulation at the temporomandibular joints. Bony cuts on the maxilla are made high on the malar processes and above the anterior nasal spine to avoid the apices of the maxillary teeth. A surgical mallet and chisel inserted in the Stryker saw cuts in the malar processes and above the anterior nasal spine are used to complete the separation of the maxilla. Remaining soft tissues in the soft palate and fauces are then dissected free.

Mallet and Chisel Method:

A mallet and chisel can be used to induce a “Le Fort” Type I fracture of the maxilla. The chisel blows are made below the zygomatic arch, high on the maxillary sinus walls bilaterally. Since it is virtually impossible to fracture the mandibular rami with the mallet and chisel, the mandible can be disarticulated at the temporomandibular joint in such cases.

Pruning Shears Method:

An alternative technique for resection of the jaws involves the use of large pruning shears. The soft tissue/muscle dissections are as described on page 10. The small blade of the pruning shears is placed within the nares and forced back into the maxillary sinus. A cut is then made along a plane superior to the apices of the maxillary teeth bilaterally. The mandibular bone cuts are performed by inserting the small blade of the shears high on the lingual aspect of the ramus near the coronoid notch bilaterally.

E. The Postmortem Dental Record:

While most morgues will have the standard autopsy equipment, the forensic odontologist may wish to assemble their own forensic kit to include mouth mirrors, explorers, camera equipment, anatomic dental charts, impression materials, cyanoacrylate, etc. Postmortem dental examinations might utilize anatomic dental charts, photographs, radiographs, models, tape recordings and/or narrative descriptions. The data collected should be comprehensive in scope since antemortem records are commonly not discovered until days, weeks or even years later. Accordingly, the post-mortem dental record will include all or most of the items given below.

1. Basic Data:

Case Number
Date/time,
jurisdiction/authority
Location
Putative ID, if any

2. Body Description, General

Approximate age
Race, sex,
condition

3. Jaw Fragment(s) Description

F. Dental Examination:

The universal tooth numbering system should be used. The record should reflect any missing dental structures or jaw fragments as well as those present and available for evaluation. The chart should illustrate as graphically as possible the following:

1. Configuration of all dental restorations (including prostheses), caries, fractures, anomalies, abrasions, implants (tooth replacement), erosions or other features for all teeth.
2. Materials used in dental restorations and prosthetic devices, when known.
3. Periodontal conditions, calculus, stain.
4. Occlusal relationships, malposed teeth; anomalous, congenitally missing and supernumerary teeth.
5. Intra oral photographs should be used to show anatomic details of teeth, restorations, periodontium, occlusion, lesions, etc.

G. Narrative Description and Nomenclature

The anatomic dental chart may be supplemented by a narrative description of the postmortem findings with particular emphasis on unusual or unique conditions. Standardized dental nomenclature should be used as follows:

1. Universal Numbering System

The system of numbering teeth that is used in the United States. The teeth are numbered from 1 to 32. The maxillary right third molar is #1, the maxillary central incisors are #8 and #9, the maxillary left third molar #16, the mandibular left third molar #17 and the mandibular right third molar is #32. The universal tooth numbering system plus the actual name of the tooth should be used (e.g. tooth #3, maxillary right first permanent molar)

2. Dentition Type and Tooth Surfaces

Primary, permanent, supernumerary, and mixed dentition. Mesial, Occlusal, Distal, Facial and Lingual surfaces (MODFL).

3. Prosthetics and other Appliances

- Crowns:** full, 3/4, 7/8, or onlay coverage restorations.
- Prosthetics:** Partial, full, or fixed dentures. Orthodontic bands, brackets, appliances, space maintainers and retainers. Mouth guards and night guards.

4. The FDI Numbering System

Odontologists should be aware of the FDI/ISO system of numbering teeth. This system is used throughout much of the world other than the United States. Quadrants are numbered from 1 to 4. The maxillary right quadrant is 1, maxillary left 2, mandibular left 3 and mandibular right 4. Teeth are numbered from the midline to the posterior. Central incisors are #1, canines #3 and third molars #8. Teeth are represented by a two digit code with the quadrant first and the tooth second. Thus, the maxillary left first molar is 26 (pronounced 2-6).

H. Dental Impressions

Impressions should be considered when bitemarks, rugae patterns or other evidence warrants the procedure.

1. Supplies and Equipment:

Appropriate trays, plastic or metal, which can be modified to fit the mouth
Alginate or other American Dental Association approved dental impression material. Type III dental stone is the material of choice for pouring models. Plaster of Paris should not be used.

2. Impressions and Preparation of Models:

Two sets of impressions, both maxillary and mandibular, are obtained in the conventional manner. Models should be trimmed and appropriately labeled with the case number and date. Also it is important to note that dental impressions on autopsy tables take longer to set.

I. Dental Radiology

Postmortem radiographs graphically complement the visual examination/charting of the oral and perioral structures and can provide significant data essential for identification (see section III). In general, radiographs are required in cases where there is no putative ID, antemortem records have not yet been located and/or the jaws cannot be retained. Postmortem radiographs must be considered the prime method of identification. A comprehensive postmortem radiographic examination might include all or some of the following views, depending on the circumstances of the case.

1. Intra oral Radiographs

Digital or analog dental bitewing and periapical radiographs of anterior and posterior teeth comparable in technique to those taken antemortem. (Bitewing views should be taken in the conventional “teeth in occlusion” manner but as an alternative periapical film can be used for separate views of the maxillary and mandibular teeth, using a horizontal bitewing angulation).

2. Dental Fragments, Dissociated Teeth

Appropriate radiographs of all dental fragments, dissociated teeth, bone and restorations should be obtained. Occlusal or lateral plate film may be used for objects larger than a periapical film.

3. Edentulous Areas

Periapical radiographs of edentulous arches or areas, especially the third molars, which may be impacted or previously extracted. Periapical radiographs of sockets of teeth lost postmortem should be taken, since antemortem radiographs of these same teeth may be the only evidence that becomes available.

4. Extra oral Radiographs

Extra oral radiographs (e.g., lateral jaw, maxillary or frontal sinus and panoramic radiographs) are often useful.

5. Disposition of Radiographs

Double pack intra oral film is recommended. One set of films should be retained by the forensic odontologist for his case file. The second set may be mounted and forwarded with a written report to the medical examiner/coroner for the master file. If digital

radiology was utilized, the odontologist should have all the digital files backed up to an external source after electronically submitting the case records.

NOTE: *All duplicate/digital films should bear right and left notations.*

II. COMPARISON OF ANTEMORTEM & POSTMORTEM EVIDENCE

This section deals with factors which may be present in both the antemortem and postmortem dental evidence and can be useful for comparison purposes. Most dental identifications are based on restorations, caries, missing teeth and/or prosthetic devices which may be readily documented in the records. It should be noted, however, that the precipitous decrease in caries incidence in recent years will dictate greater reliance on other dental findings in the future. It is emphasized that, given adequate records, a nearly infinite number of objective factors have identification value (see Section IV). Thus, objective findings, particularly those which are unique to the individual, provide the basis for concordance or exclusion. Concomitantly, apparent discrepancies between the antemortem and postmortem evidence (e.g. errors in recording, dental treatment subsequent to the available antemortem record) must be resolved. The following subsections provide examples of objective findings in the teeth, periodontium, and/or jaws, which may be demonstrable in both antemortem and postmortem records. While the factors listed are by no means comprehensive, they may serve as a checklist and demonstrate the range of objective findings that may be applicable in difficult identification cases.

Dental Features Useful in Identification:

Teeth:

Teeth present-erupted

Teeth present-unerupted/impacted

Missing Teeth:

Congenitally missing

Lost antemortem

Lost perimortem/postmortem

Tooth Type:

Permanent mixed dentition

Retained primary teeth

Supernumerary teeth

Tooth Position

Malpositions: facial/lingual version, rotations, supra/infra positions, diastemas, other occlusal discrepancies

Crown Morphology

Size and shape of crowns

Enamel thickness

Location of contact points, cemento-enamel junction

Racial variations: e.g. shovel-shaped incisors, Carabelli cusp, etc.

Crown Pathology

Caries

Attrition/abrasion/erosion

Atypical variations: e.g. peg laterals, fusion/gemination, enamel pearl, multiple cusps

Dens in dente

Dentigerous cyst

Root Morphology

Size, shape, number, dilaceration, divergence of roots

Root Pathology

Root fracture, hypercementosis, external root resorption, root hemisections

Pulp Chamber and Root Canal Morphology

Size, shape, number, secondary dentin

Pulp Chamber and Root Canal Pathology

Pulp stones, dystrophic calcification

Root canal therapy: e.g. gutta percha, silver points, endo paste, nanoparticulates, posts, and retro-fill procedures

Internal resorption, apicoectomy, periapical pathology, periapical abscess/granuloma/cyst, cementoma, condensing osteitis

Dental Restorations

Metallic restorations: amalgams, gold or non-precious metal crowns/inlays, endo-posts, pins, fixed prostheses, implants

Non-metallic restorations: acrylics, silicates, composites, glass ionomers, porcelain, zirconia, etc.

Partial and full removal prostheses

Periodontium

Gingiva: morphology/pathology

Contour: gingival recession, focal/ diffuse enlargements, interproximal craters

Color: inflammatory changes, physiologic or pathologic pigmentations

Plaque and concretions oral hygiene status, stains, calculus

Periodontal Ligament: Morphology/Pathology

Thickness

Widening (e.g. scleroderma), lateral periodontal cyst

Alveolar process and lamina dura, height/contour/density of crestal bone, thickness of inter-radicular alveolar bone exostoses, tori

Pattern of lamina dura (loss, increased density) periodontal bone loss

Trabecular bone pattern osteoporosis, radio-densities

Residual root fragments, metallic fragments

Maxilla and Mandible:

Anatomical landmarks/pathology

Maxillary sinuses: size, shape, retention cyst, antrolith, foreign bodies, oral-antral fistula

Relationship to adjacent teeth, anterior nasal spine, incisive canal, median palatal suture, incisive canal size, shape, cysts

Pterygoid hamulus: size, shape, fracture

Mandibular canal/mental foramen: diameter, anomalous (bifurcated) canal, relationship to adjacent teeth, coronoid and condylar process size and shape, temporomandibular joint size and shape, hypertrophy/ atrophy, ankylosis, fracture, arthritic changes

Other pathologic processes/jaw bones:

Developmental/fissural cysts, hemorrhagic (traumatic) bone cyst, salivary gland depression, reactive/neoplastic lesions, metabolic bone disease

Other disorders inducing focal or diffuse radiolucencies or radiopacities, evidence of orthognathic surgery or prior evidence of trauma (e.g. wire sutures, surgical pins, etc.

III. CATEGORIES & TERMINOLOGY FOR BODY IDENTIFICATION

A. Positive Identification

The antemortem and postmortem data match in sufficient detail to establish that they are from the same individual. In addition, there are no irreconcilable discrepancies.

B. Possible Identification

The antemortem and postmortem data have consistent features, but, due to the quality of either the postmortem remains or the antemortem evidence, it is not possible to positively establish dental identification.

C. Insufficient Evidence

The available information is insufficient to form the basis for a conclusion.

D. Exclusion

The antemortem and postmortem data are clearly inconsistent. However, it should be understood that identification by exclusion is a valid technique in certain circumstances.

NOTE: The forensic dentist is not ordinarily in a position to verify that the antemortem records are correct as to name, date, etc.; therefore, the report should state that the conclusions are based on records which are purported to represent a particular individual.

ABFO Standards and Guidelines for Dental Age Assessment

These standards and guidelines are the collective effort of the American Board of Forensic Odontology, Age Assessment Committee. The use of these standards and guidelines is intended to enhance the quality of forensic dental age assessment and reporting.

Use of other age assessment modalities such as anthropologic methodologies should be considered if available. All age assessment methods have advantages and shortcomings, and are dependent upon the availability or existence of suitable population specific reference data.

Purpose and Value

Forensic dental age assessment results in the estimation of an individual's chronologic age through scientific evaluation of the dentition and surrounding structures. Medico-legal applications in the deceased include estimation of the age at death to narrow search parameters and thereby assist in the identification of missing and unidentified individuals. In situations involving living individuals, dental age assessment has assisted in immigration, legal age of majority and legal age of license cases. Forensic dental age assessment practitioners should utilize the developed guidelines and standards to the fullest extent applicable, practical and appropriate to ensure scientific integrity.

General Principles

Method(s) to be employed depend upon the specific circumstances of each case. The analysis of fetal, infant, child, adolescent and adult dentitions may involve various techniques including gross examination, the use of radiographic analysis, histologic and biochemical evaluation. Forensic age assessment guidelines recommend approaches for estimating age giving consideration to the likely age range of the individual. Thoughtful consideration should be given to sex, ancestry, population specificity and environmental factors.

Definitions

Standards: Established protocols that are compulsory minimal level of practice.

Guidelines: Recommended procedures that help direct but are not required.

The use of the words “**shall**”, “**should**” and “**must**” follows the 2003 American National Standards Institute (ANSI) ,https://www.usug.org/answg/pdf/ANSI_Style_Guidesheet_-_2003.pdf, style guidelines on the correct form of requirements and recommendations:

- **Shall** is the correct verb form for indicating a requirement. Use **shall** for indicating a mandatory aspect or an aspect on which there is no option.

- **Should** is the correct verb form for indicating a recommendation where it is considered the best among numerous options or there is insufficient scientific evidence to definitively support its mandatory use.
- **Must is NOT a term recognized by ANSI and shall not be used**

Dental Age Assessment: The processes used to produce an estimation of an individual's chronologic/biologic age using dental data.

Dental Age Estimation: The mean age, age interval, and corresponding measure of the uncertainty that results from Dental Age Assessment.

Technique: A method or procedure used for age assessment.

Study: A detailed investigation and analysis of a specific population to relate chronologic age to dental development.

Rate of Uncertainty: The statistical error rate that should minimally reflect 95% of a given population or two (2) Standard Deviations (SD). If SD is not the statistical error rate utilized by a published study, then the appropriate corresponding error rate used by that study should be reported.

Prenatal/Fetal Dental Age Interval: That interval in human dental development that occurs prior to birth.

Infant/Child Dental Age Interval: That interval in human dental development that includes the postnatal presence of the developing and resorbing primary dentition including the period of mixed primary and secondary dentitions.

Adolescent Dental Age Interval: That interval in human dental development that includes the presence of the developed and developing secondary dentition. Retained primary teeth may also be present as a special circumstance during this interval.

Adult Dental Age Interval: That interval in human dental development where all teeth present have completed crown/root development and are therefore considered dentally mature.

Standards

1. The odontologist shall provide appropriate and accurate assessments of chronologic age utilizing scientific methodology.
2. The odontologist shall be familiar with currently recommended age assessment methods and shall utilize the appropriate age assessment method(s) for the case at hand.
3. The odontologist shall consider all available information, including sex, ancestry, population specificity, biological information and environmental factors.

4. The odontologist shall utilize the most appropriate statistical data to apply in the assessment of an individual's chronologic age.
5. When practical, the odontologist shall use multiple independent statistical methodologies and shall report the results of each independent statistical method utilized.
6. The odontologist shall precisely follow the specific methodology outlined, including morphologic staging and criteria measurements, within the study being utilized for the selected age assessment technique when estimating chronologic age.
7. When the technique utilized allows, the odontologist shall include a probability statement that the individual has attained the age in question for immigration and legal age of majority cases.

Guidelines

The Odontologist **Should** Record:

1. Case Identification Data:
 - a. Case number
 - b. Referring agency (Person requesting the age estimation)
 - c. Name of the examiner(s)
 - d. Date of the examination
 - e. If known, the individual's name and stated date of birth
 - f. Other pertinent informational data
2. Biographical Information of the Individual:
 - a. Ancestry and geographic population specificity
 - b. Sex
 - c. Nutritional health
 - d. Current and prior systemic diseases
 - e. Socioeconomic status
 - f. Habits and addictions that may affect health or the maxillofacial structures
 - g. Any other environmental factors that may affect morphologic or post-formation dental and skeletal development
3. Dental Evidence Observed, Collected and Measured:
 - a. Specific teeth utilized in the evaluation.
 - b. Age assessment criteria including but not limited to:
 - i. Morphologic developmental staging
 - ii. Eruption Pattern

- iii. Root translucency, Secondary dentin apposition, attrition, periodontal health, or any other measured dental developmental or post-formation characteristics.
 - c. Occlusion
 - d. Oral hygiene
 - e. Pathology
 - f. Photographs (Document Photographer and Agency Affiliation)
 - g. Radiographs (Document Radiographer and Agency Affiliation)
4. Dental Age Assessment Methods/Techniques:

Atlas

Atlas dental age assessment techniques utilize diagrammatic representations of the morphologic developing tooth structures with their associated eruption pattern. Atlas techniques are non-sex specific and have a limited number of population specific data sets resulting in a higher degree of variability particularly in mid-childhood through adolescence. In addition, Atlas techniques are often derived from mixed ethnic data. Atlas techniques are particularly useful in mass disaster and clustered victim situations due to their ability to rapidly segregate child, adolescent, and adult remains into age intervals.

Infant/Child

Infant/Child dental age assessment techniques utilize radiographic evaluation to stage the degree of morphologic development of the primary and/or secondary dentition as well as resorption of the primary dentition. Infant/Child techniques should consider sex, ancestry, and population specificity. Therefore, these techniques will generally provide a more accurate and reliable estimate of age over eruption and atlas methodologies.

Adolescent

Adolescent dental age assessment techniques utilize radiographic evaluation to stage the degree of dental development toward the latter half of dental morphologic maturation. Although, the third molar exhibits the highest degree of morphologic developmental variability, it remains extremely useful in the assessment of age. While teeth other than the third molar continue to undergo morphologic development, early adolescence age assessment methodology should be utilized. Late adolescent age assessment techniques should be utilized when the third molar is the only remaining tooth continuing to undergo morphologic development. These techniques play a useful role in assisting legal authorities in determining the disposition of cases involving immigration, asylum seekers and legal age of majority or license.

Adult

Adult dental age assessment techniques may utilize radiographic morphological evaluation as well as gross and microscopic observation of post-formation changes within the dentition following the cessation of morphologic dental development. Although others have been described, there are six traditional post-formation variables that have been utilized in the assessment of adult chronologic age. They are: root transparency, secondary dentin deposition, periodontal attachment, cementum apposition, attrition and root resorption. The most useful of the criteria are root transparency and secondary dentin deposition. The least valuable criterion is root resorption. Ethical considerations may restrict the use of many adult age assessment methodologies due to the requirement of sacrificing tooth structure.

Biochemical

Biochemical dental age assessment techniques require the sampling of dental tissues for evaluation. Current techniques include analysis of amino acid racemization and determination of the level of radioactive carbon in dental enamel. Racemization techniques estimate age at tooth extraction or death while radioactive carbon analysis estimates the date of birth for individuals born after 1943. These techniques are useful in all age groups and offer a relatively narrow age estimation interval. However, they introduce ethical considerations for tooth sampling in the living and are laboratory procedures that require considerable time and cost to process.

The Forensic Dental Age Assessment Report Should Include:

Introduction:

This section provides background information which should include;

Case Identification Data

Biographical Information regarding the individual

Inventory of Evidence:

This section lists all evidence received, observed and/or collected by the forensic odontologist and details the source of the evidence

Method(s) of Analysis:

This section describes the analytic method(s)/scientific technique(s) and population specific data used in the dental age assessment. A list of anatomic structures analyzed, specific technique(s) utilized, and the published study where statistical data was obtained should be included in the final forensic report.

Opinion/Conclusions:

This section summarizes the expert's results which should include: an overall estimate of chronologic age and an estimate of chronologic age for each technique utilized, preferably with an associated age interval at a rate of 95% certainty (2 standard deviations). Additionally, when appropriate to the case, a probability statement regarding an individual's attainment of specific age.

Disclaimer:

A disclaimer statement indicating that the opinion is subject to review and/or modification if additional information or evidence becomes available.

Summary

The final age assessment results from the dental provider's expert judgment by considering all available information. Conclusion statements specific to each methodology employed should include an estimated mean age and age interval and an associated rate of uncertainty. When the information is available, the rate of uncertainty should statistically consider 95% of the specific population, or two standard deviations. If the peer reviewed published scientific study(s) utilized to assess chronologic age do not provide two standard deviation statistical rates of uncertainty, then, the rate of uncertainty defined by that study should be clearly stated in the forensic report.

Resources:

ABFO Supplemental Age Assessment Charts: <http://abfo.org> (Located under Resources Tab)

- ABFO Dental Age Assessment Procedures Chart
- ABFO Child/Adolescent Dental Age Assessment Technique Chart
- ABFO Adult Dental Age Assessment Technique Chart

Lewis, J.M., Senn D.R., 2013. Dental age estimation. In: Senn, DR, Weems RA (Eds), Manual of Forensic Odontology, 5th Edition. Taylor and Francis Group, Boca Raton, FL, pp. 221-255.

Harris, E.F., Mincer H.H., Anderson K.M., Senn D.R. 2010. Age estimation from oral and dental structures. In: Senn, D.R., Stimpson, P.G. (Eds), Forensic Dentistry, Second edn. Taylor and Frances Group, Boca Raton, FL, pp. 263-303.

Nelson, Stanly J., and Major M. Ash. 2010. Development and eruption of the teeth. In *Wheeler's Dental Anatomy, Physiology, and Occlusion, Ninth edn.*, 21-44. St. Louis: Saunders Elsevier.

V. Gilsanz and O. Ratib 2010. Hand Bone Age: A Digital Atlas of Skeletal Maturity, Second Edition, Springer.

<http://www.chospab.es/biblioteca/DOCUMENTOS/Atlas of Hand Bone Age.pdf>

ABFO Dental Age Assessment Workshop (Check ABFO Website for current dates):

<http://abfo.org>

Draft Age Estimation Quicksheets™ (Assists the odontologist in calculating age, age range and rate of uncertainty using Excel Spreadsheets):

DAEQuicksheets@gmail.com

UT Age Program (Assists the odontologist in calculating age, age range and % probability of having attained a specific age. For use on Adolescents with developing third molars)

<http://logisys-consulting.com/agesetup.msi>

London Atlas of Tooth Development and Eruption 2010 Interactive Website:

<https://atlas.dentistry.qmul.ac.uk/>

Dental Age Research London Information Group (DARLInG): This assembly of pages, diagrams, numerical explanations and statistics has been written to provide a detailed and understandable explanation of the theory and practice of Dental Age Estimation. In addition, a library of Dental Age Assessment articles can be located on this web site.

<http://www.dentalage.co.uk/>

International Organization for Forensic Odonto-Stomatology (**I.O.F.O.S.**):

<http://www.iofos.eu/>

APPENDICES

SOURCES FOR ANTEMORTEM DATA

Antemortem data may include as dental radiographs, written records, models and collection of antemortem records is ordinarily the responsibility of the investigative agency that has access to missing person's reports at the local, state or national level. However, the forensic odontologist may recognize additional characteristics. (e.g., prior orthodontic treatment) which could be helpful in establishing a putative ID. This section lists a variety of resource agencies and/or individuals that might provide assistance in locating records.

A. Local Agencies

Hospitals, Other Health Care Facilities
Dental Schools
Health Care Providers
Employer Dental Insurance Carrier
Public Aid Insurance Administrator

B. State Agencies

The following state resources are available if dental records for an unknown decedent cannot be obtained locally, and investigation provides leads as to a possible previous state of residence of the victim. A list of state agencies is maintained on the ABFO website: www.abfo.org

U.S. MILITARY RECORDS:

Department of Veterans Affairs
Service Record/Dental Records
P.O. Box 150950
St. Louis, MO 63115
National Personnel Records Center
9700 Page Ave.
St. Louis, MO 63132-5100
Contact Person: Barbara Bauman(314) 801-0589

DENTAL INSURANCE COMPANIES:

Delta Dental of California
California Department of Health Services
Sacramento, CA
(916) 464-0379
(916) 464-5703

FEDERAL AGENCIES

FBI National Crime Information Center (NCIC)

NCIC/FBI Building
10th and Pennsylvania
N.W. Washington, D.C. 20535
(202) 324-5049

Interpol
U.S. Dept. of Justice
Washington, D.C.
Military Records Depository
900 Page Blvd.
St. Louis, MO

INTERNATIONAL RESOURCES

UK Derek Clarke, London Hospital, Medical College
Canada, Robert Dorion, D.M.D., Montreal
Germany Dr. Klaus Raucher
Australia Dr. Kenneth Brown University of Adelaide, SA

INSURANCE CARRIERS

Mr. Lou Saporito
Director of Field Operations
Dental Relations Committee
The Health Insurance Association of America
1025 Connecticut Avenue, N.W.
Washington, D.C. 20036

Betty Hainsfurther
Council on Dental Care Programs
American Dental Association
211 E. Chicago Avenue
Chicago, IL 60611

Dr. John Thorpe
Illinois Blue Cross
233 N. Michigan
Chicago, IL 60601

Mr. Jim Bonk
Delta Dental Plan
Suite 1010
211 E. Chicago Avenue
Chicago, IL 60611

OTHER SOURCES

Family/Friends/Co-workers
Public Aid Insurance Administrator
Employer Dental Insurance Carrier
Prior Military Service
Prior Judicial Detention in County
State or Federal Institutions
Prior Hospitalizations (e.g. Chest Films, Skull Films)
Oral Surgeons, or Orthodontists in the Area
Veterans Administration Hospitals
Any Previous Areas of Residence
Chiropractic X-rays

WEBSITES

National

American Association of Missing and Exploited Children's Organizations (AMECO)
<http://www.amecoinc.org/clearinghouse.htm>

Center for Disease Control and Prevention. National Violent Death Reporting System,
<http://www.cdc.gov/ncipc/profiles/nvdrs/default.htm>

National Center for Missing Adults (NCMA)
<http://www.theyaremissd.org/ncma>

National Crime Information Center (NCIC)
<http://www.fbi.gov/hq/cjisd/ncic.htm> (not open to the public)

National Missing and Unidentified Persons System (NamUs)
<http://www.NamUs.gov> (National online repository for missing persons and unidentified dead cases)

The Doe Network (International Center for Unidentified and Missing Persons)
<http://www.doenetwork.org>

National Center for Missing and Exploited Children (NCMEC)
<http://www.missingkids.com> (Input from the public accepted 1-800-THE LOST)

North American Missing Persons Network (NAMPN)
<http://www.nampn.org>

National Dental Image Repository (NDIR)
Available only at Law Enforcement on Line Email images to NDIR@leo.gov

State and Local

California Missing Persons (1-800-222-FIND)

<http://www.ag.ca.gov/missing>

Clark County Coroners Office (Las Vegas, NV)

<http://www.acesclarkcounty.net/coroner/unid.htm>

Colorado Coroners Association

<http://www.coloradocoroners.org>

Florida Unidentified Decedents Database

<http://www.fluiddb.com>

Florida Unidentified Deceased Initiative

http://www.fdle.state.fl.us/cjst/mec/identifyinggunidentifieddeceased/identifying_deceased.html

Fulton County Medical Examiner's Office

<http://www.fcmeo.org/uidtrifold.htm> (Unidentified Victim's Listings)

Georgia Unidentified Remains (Cases from the Georgia Bureau of Investigation)

<http://www.ganet.org/gbi/uidlist.cgi/>

Illinois State Police – Unsolved Cases

<http://www.isp.state.il.us/crime/unsolved.cfm>

Iowa Unidentified Persons and Bodies

http://www.dps.state.ia.us/dci/unidentified_bodies/index.shtml

John and Jane Doe Case Files (Coroner's Division of the Orange County Sheriff-Coroner, Santa Ana, California)

<http://www.ocsd.org>

Los Angeles County Coroner

<http://coroner.co.la.ca.us/htm/uiptest.cfm>

Kentucky Office of the State Medical Examiner's Unidentified Remains Database

<http://www.unidentifiedremains.net>

LSU FACES Lab (Louisiana State University – Forensic Anthropology)

<http://www.lsu.edu/faceslab>

Maricopa County Sheriff Office (Maricopa County, Arizona)

<http://www.mcso.org/index.php?a=getmodule&mn=unsolved&page=getall>

Maryland Missing Persons Network

<http://www.marylandmissing.com/home.html>

New York State's Unidentified

http://www.troopers.state.ny.us/wanted_and_missing/unidentified/

New York State Police

<http://www.ci.nyc.ny.us/html/nypd/html/missing/missing-unid.html>

Pennsylvania State Police Files

<http://www.psp.state.pa.us/psp/cwp/browse.asp?a=3&bc=o&c=20795>

Riverside County Sheriff/Coroner's Office (Riverside County, California)

http://www.riversidesheriff.org/coroner.org/unidentified_bodies.htm

South Carolina Unidentified Persons (South Carolina Coroner Association)

http://www.sc-coroners.org/unidentified_bodies.htm

Texas Unidentified Persons (Texas Missing Persons Clearinghouse)

<http://www.txdps.state.tx.us/mpch/>

The Chattanooga, Hamilton County Medical Examiner

<http://www.hamiltontn.gov/medicalexaminer/intro.htm>

Unidentified Bodies (Office of the Sheriff, Camden County, New Jersey)

<http://www.co.camden.nj.us/sheriff/unidentified%20bodies.htm>

Unidentified Human Remains (Michigan State Police Crime Laboratory)

<http://members.aol.com/stevenkl/remains.htm>

Unidentified Persons (Larimer County Medical Examiner Office, Colorado)

<http://www.co.larimer.co.us/coroner/coronerudp.htm>

Unidentified Remains.net (Kentucky State Medical Examiner Office)

<http://www.unidentifiedremains.net/>

International

Ontario Provincial Police (Ontario, Canada)

<http://www.opp.ca/investigative/unidentifiedremains/index.htm>

Saskatchewan Missing and Unidentified Persons (Saskatchewan Association of Chiefs of Police, Canada)

<http://www.sacp.ca/missing/index.php>

American Board of Forensic Odontology, Inc
Diplomates Reference Manual
Section III: Policies, Procedures, Guidelines & Standards

Dental Information in Missing and Unidentified Persons Cases

Introduction

Purpose

These guidelines were designed as a resource for those agencies, jurisdictions, and individuals who have an interest or a responsibility in missing person and/ or unidentified body cases. Dental verification has long been accepted as a reliable means of human identification, but many times the responsible officials do not completely understand the technical requirements of forensic odontology (dentistry). It is hoped that the information provided here will assist the forensic odontologist and law enforcement personnel in those cases that require or involve this type of evidence.

Missing Person Cases

The Missing Person Report

The missing person report begins with that first contact from a family member or friend. This is the most critical time in the entire process, and the most often neglected by police agencies. Often times the assignment to “missing persons” is either neglected or given to the most junior officer in the department with turnover commonly frequent. This makes it a seemingly unimportant duty, one that no one would want to have. It may not be illegal to be missing, but these cases are important to family members and without this information some cases will go unresolved. It is important and the assignment of personnel to this task should acknowledge that importance within the department.

It is during this initial contact that three things can be accomplished. Complete information regarding the missing needs to be recorded; the family needs to be reassured that their case is important; and favorable public relations for the agency within the community should be realized. This is the time to gather as much information as possible.

The reporting individual is already upset; as a result, the recording officer can do little that will cause him/her much additional grief at this time. Ask all of the questions now; returning later will surely only cause additional unnecessary anguish. Most law enforcement agencies have standard forms for recording missing person reports. It is important that these forms include adequate space for medical and dental information. Ask the reporting person about the missing person’s medical and dental history:

1. Name and address of dentist(s)
2. Did he/she go to the dentist regularly?
3. Did he/she have a regular dentist? Here? Previous home locations? Previous military service? Which branch?
4. Other dental sources (specialists): orthodontists (straightening), oral surgeons, periodontists (gum disease), endodontists (root canals), prosthodontists (dentures, partials, crown and bridge and implants).
5. Medical history, including physician names, hospitalizations, accidents,

illnesses, etc. Be specific about head and chest injuries, these often result in medical x-rays that show some dental features. Ask for this information now. As mentioned before, the family is already upset or they would not be reporting the disappearance. As a result, there is little that the recording officer can do to further this grief, unless he/she is completely insensitive. To return later for dental information can upset the family needlessly. What can be worse than to have an officer call thirty, sixty, ninety days later and state:

“We found a body we think may be your missing loved one. A visual identification is impossible. Can you give us the name of his/her dentist?” Does that sound cruel and insensitive? What if the body turns out not to be the suspected missing person? It happens all too often! There will be officers who read this, who will say: “Wait a minute. I’m not going to gather all of that information on every runaway kid and hooker that gets reported missing. They usually turn up in a few days anyway.” And he/she would be right. But taking the information at the initial report does not mean that those actual records have to be gathered immediately from those sources. When a reasonable time has passed (varies with the case) the data can then be located and collected. Some agencies actually use a return call on missing person cases. This lets them confirm that the person is still missing and it can have a positive public relations effect by letting the family know that they are still working the case. The time lag between report and follow up will vary with the particular case, but one to two weeks for most cases is probably appropriate. If there has been no contact during that period, then it is time to research and gather the dental data and share it with other agencies.

Gathering the Dental Information

There is no real need to delay collecting the dental information beyond thirty days. This should be viewed as a maximum time for gathering and reporting. In most cases, two to three weeks are more appropriate. When contacting a dental or medical office, the officer should appropriately identify himself/herself and explain the nature of the investigation and the information that he/she is requesting. Most offices will voluntarily cooperate fully; some states have laws that permit police access; and if not, a subpoena or threat of a subpoena, will usually facilitate access. Remember, this office may have information that could lead to other sources, i.e. previous dentists, specialist referrals, medical history, etc.

All available information should be retrieved. This will include:

1. Complete written records or good quality, readable photocopies. The originals are preferred.
2. Original radiographs or good quality duplicates. Again the originals are preferred. If duplicates are provided they need to be accurately labeled as to left-right orientation, and include all dates, etc.
3. Plaster or stone models (study models), if available.
4. Photographs if available. Some offices have prints or videos of patients in various stages of treatment.
5. Any other information that is available concerning that patient. Military records can be researched by contacting the nearest military base with the appropriate branch of service for the missing person. The military

intelligence office is the resource for information concerning former members. Try to obtain records from more than one office if possible, even if one is quite old. This will help to authenticate the antemortem evidence. If no leads are available from the missing person report, contacting local area dental offices and medical facilities may produce some positive results. Insurance companies and the state Department of Health and Welfare may also provide useful information. be imaginative; there is probably some information out there somewhere. Refer to the ABFO Body Identification Guidelines for further sources.

Using the Dental Information

The first thing to do after gathering this information is to include it in the missing person report. It should not just be filed away and forgotten. It has value to the case and as such it needs to be utilized. Whether a possible identity has been determined or not, the services of a forensic odontologist should be employed at this time. The process of deciphering and putting the dental information into a useable missing person dental form is rarely an easy task. Quite often the written dental record is incomplete or illegible. For this reason, a trained forensic dentist should be consulted for this task and the task of filling out forms from any local, state, or national dental data base programs.

Again, often these forms require some familiarity and experience to properly complete; and accuracy at this point is more important than speed.

The logical first step is to have the consulting forensic expert compare this newly acquired dental data with any available postmortem evidence. If no local match is found, the information should be shared with other local, regional and national agencies that are equipped to handle this type of data. A more detailed explanation of these programs is described below, under the heading “Search/Comparison Programs.”

07/95

Unidentified Body Cases

The Unidentified Body Report

Whenever a deceased body is discovered and especially when a timely identification is not anticipated, all available identifying physical evidence needs to be gathered and preserved. This should be accomplished before the body leaves the custody of the responsible investigative authorities. Besides fingerprints, photographs and DNA samples, dental information should be recorded in all cases involving a death, whenever there may be some present or future need to verify the identity of the individual with a degree of scientific certainty. Please refer again to the ABFO Body Identification Guidelines. Though it is usually the burned, decomposed, or severely traumatized case that ultimately requires dental identification, there is always the possibility that dental verification may be the only scientific method available in other less obvious cases. The conscientious investigator should never allow an unidentified body to be disposed of without taking fingerprints, if available. So it should be with any available dental evidence. In addition, with the increasing use of computer based dental comparison programs, it may be that the ultimate clue to the true identity may come from the dental evidence. Rapid identification can be critical in case resolution. A trained forensic odontologist should be retained to perform the examination and necessary record-taking, so that all recorded information is accurate, complete and preserved properly. It is always best to do this immediately, and to do it right. This will greatly reduce the necessity of having to exhume the body at a later date and thereby incurring additional expenses, and embarrassment. Be complete and be accurate. And most importantly: Do it right the first time! It should be noted here that law enforcement should expect the following from any dental consultant that they employ:

1. A written forensic dental report of findings, recommendations and conclusions.
2. Copies of all documentation, including charting, photographs, models and radiographs.
3. Prompt completion of all examinations and reports, or an explanation of why more time is needed.
4. Completed submission forms for NCIC or other search/comparison programs.

Gathering the Dental Information

The dental examination is conducted under the authority and direction of the coroner/medical examiner and generally is carried out in a morgue, funeral home, or private consultant facility, as designated by each jurisdiction. The first concern is the retrieval and transportation of the body or body parts, including the dental evidence, intact to that/those facilities.

Severely Fragmented Body

In those cases that involve severely fragmented victims, the area should be carefully

checked for any remaining and not readily apparent hard and soft tissue fragments. This may require the assistance of experts trained in fragment search and recover. Certainly, a grid search is recommended in most of these cases. Any recovered body parts or evidence should be placed in a body bag or other appropriate evidence container for transportation. It is important to note that this should be accomplished only after proper notation of the location of the fragment(s) has been made.

Decomposed Body

The decomposed body generally has the oral structures intact, but the decomposition process in many cases will cause the fibers which hold the teeth to the bone in the dental arches to breakdown. With this breakdown of the periodontal fibers, the teeth, especially those with straight roots (like the front teeth), can be easily dislodged and potentially lost prior to examination. Before moving the body, note the absence of any front teeth by separating the lips gently. If some are missing from open sockets, look to see if there are any teeth near the body. If not, those teeth may be found later during the examination. They are often located at the back of the mouth. If not found, the sight of the body should be revisited and searched for the missing evidence as described above. Action must be taken when moving the body so that any loose teeth are not inadvertently bumped and dislodged.

Severely Burned Body

In all severely burned cases, **EXTREME CAUTION MUST BE TAKEN** in transporting the body, not because whole teeth will dislodge but because the heat may have so desiccated and charred the crowns of the teeth that merely touching them may cause them to shatter. If the teeth appear likely to be fragile, close-up photographs of the dentition prior to careful transport may be helpful in reconstruction, if there is damage during the movement of the body. Above all, great care should be taken not to jar the body during transport. All surrounding debris which might contain dental evidence should be recovered as well, so that it can be inspected for dental fragments. Once in the examination facility, it is sometimes possible to reinforce the dental structures so that they are not as likely to fracture by spraying an adhesive over the teeth. Attempts to maintain as much intact tooth structure and its supporting bone may be critical in verifying the identity of the victim.

Skeletonized Body

In skeletonized cases, the teeth are readily visible but as in the decomposed cases, the soft tissue attachment between the teeth and the bone is no longer holding the teeth in the skeleton. Therefore, straight rooted teeth are easily and often lost. If the body has been buried or animal activity has caused the skeleton to be moved, it may be advisable to sift the surrounding ground for small bones, teeth or other evidence. These fragments can be tagged and brought to the facility for examination.

Preserving the Dental Information

A forensic odontologist should be retained to perform the examination and necessary

record-taking so that all recorded information is accurate and preserved in such a way in the report as to facilitate potential comparisons. As stated earlier, a more complete technical outline for body identification, prepared by the American Board of Forensic Odontology, is available in the Journal of the American Dental Association. [3]

Visual Examination And Dental Charting This procedure is fairly straight forward. A complete visual inventory and written record of the remaining dental evidence is basic to any forensic dental examination. The investigating dentist should note and record any and all oral and dental features on a form designed for that purpose. This will form the basis for later comparisons in both verification and search activities.

The actual diagrammatic dental chart used is relatively unimportant. However, whatever chart is employed should allow enough space for adequate notations in either words and/or diagrams of all the existing conditions. It is also recommended that all charting designations for the individual teeth be made in the “universal numbering system” [3].

The visual examination and subsequent dental charting can be a relatively easy procedure or a very tedious difficult task, depending on the accessibility of the teeth and the condition of the remains. Where all of the teeth remain in the bony arches, forcing the jaws open, in some cases breaking the rigor mortis, and cleaning the teeth is all that is, necessary. In cases of severe burning, it is sometimes necessary to carefully remove the upper and jaws so that cleaning and complete examination may be performed.

Dental Radiographs

Every postmortem dental examination should include the taking of dental radiographs (x-ray films). The reasons for this are twofold. First, a completely accurate dental charting without radiographs is not possible, since there are many conditions that are only detectable by this method, i.e. root canals, retained roots, impacted teeth, etc. And secondly, dental films are the hard evidence that will be needed to substantiate any conclusions in the case. Anyone can make recording errors on a chart; the radiographs are solid objective recordings of the actual dental characteristics. A thorough postmortem dental radiographic examination should include a complete series of periapical films of the available dental structures. Bitewing type films should also be included since they are the most common type found in dental records. No matter what types are taken, it is important that any films be properly angulated, well exposed, and well processed (developed and fixed). Besides periapicals and bitewings, there are several other different types of films available. These include panoramic, occlusal, and medical type films, such as lateral head and anterior/posterior skull views.

Bitewing Radiographs

These are the most common type of radiograph found in dentistry and therefore, likely to turn up as part of the antemortem dental record. In fact, quite often it is the only type of dental film available. Because they are taken of both jaws at the same time (in occlusion), these films generally show the upper and lower teeth in close approximation, therefore, depicting the full crowns of all of the teeth visible in the exposure. These films do not show the areas around the ends of the roots and therefore may not disclose some very useful information. If the jaws and teeth are severely fragmented of the teeth very fragile, it may be

difficult to secure radiographs of this type for the postmortem dental record. None the less, every effort should be made to include bitewings in this examination.

Periapical Radiographs

The periapical dental film is taken of one jaw at a time, and it shows the bony structure at and around the end of the root as well as the entire teeth itself. Depending on the location and condition of the individual, usually two to four teeth will show fairly completely on one of these films. These should be taken in all areas of the dental arches, even those not containing visible teeth, since teeth or other characteristics can be impacted or hidden within the bony structures. A full set of these films should be taken along any bitewings films. A full set of periapical films will usually include about fourteen films of the standard dental size.

Panoramic Radiographs

This type of film provides a large single radiograph that shows most of the lower face including both jaws, the sinus cavities, nasal passages, lower portions of the eye sockets, and the angles of the mandible. The film is taken with the head stabilized in a cradle while the x-ray source and the film cassette both travel around the head. These films are not routinely taken in most dental offices; however they are common enough that their use in forensics has to be considered. They should be used for comparison to antemortem dental films cautiously if the antemortem films are of a different type. This is because: (1) The film is so large that individual teeth and supporting structures are often overlapped and/or distorted, making comparison to other film types difficult and (2) the sheer logistics of positioning a decedent's head, jaw or jaw fragments, onto the machine may prevent the production of a quality image.

Medical Radiographs

These films are those radiographs commonly taken for orthodontic purposes or for diagnosis of head injuries, sinus problems and the like. These films usually show the entire skull from a particular view or exposure. While anatomical features such the sinuses, especially the frontal sinus in an anterior/posterior view or a Waters view, can be beautifully depicted, the visualization of the teeth is difficult due to overlapping of teeth, superimposition of the right and left sides of the arches and other types of distortion. All of these factors can make comparison of specific dental features very difficult.

Photographs

Although generally not as critical as the dental radiographs, dental photographs are very helpful in preserving the evidence, especially when there is some unique dental feature which would be difficult to describe otherwise. Photography can also provide a double check for possible recording errors. In addition, photographs, particularly those of the front teeth, may be useful for comparisons to antemortem photographs which show unusual features of these teeth. These photographs should include all those views that the investigating forensic dentist feels are important.

Study Models

Study models are seldom used to preserve evidence in identification cases. Due to fragility of the teeth in some situations and the breakdown of the soft tissue in others, taking impressions can,

under certain circumstances, alter the existing evidence. However, for any given particular case, it may be a procedure that the examining forensic dentist would feel is necessary.

Preservation of Jaw and Tooth Fragments

In those cases where the dental evidence is minimal or questionable in some way, and/or if the body is to be disposed of by cremation, the dental evidence should be removed from the remainder of the body, marked and properly stored for future examination and study. Refer to the ABFO Body Identification Guidelines for information concerning removal and storage.

Skeletal Remains

These specimens should be thoroughly cleaned and stored in such a way as to insure retention of all dental evidence, keeping in mind that teeth are easily lost from their sockets.

Jaws with Soft Tissue Remaining

If necessary resect or remove the jaws from the supporting bone and muscle attachments. The specimen must be cleaned and then stored in a standard morgue formalin solution.

Authorization for Removal of Dental Structures

Resection of the deceased remains will require legal authorization before proceeding. The form of that authority will vary depending on the jurisdiction in which the examination occurs. At the very least it is necessary to obtain permission for the resection from the coroner/medical examiner under whose authority the case falls. The methods of resection will vary with the situation and will include use of an autopsy saw, mallet and chisel, or pruning shears. A forensic dentist will be familiar with the technique most applicable to each particular case.

Using the Dental Information

Once all of the postmortem records are complete, these should become part of the unidentified persons file in the coroner/medical examiner's office. The logical next step after the report is completed is to have the consulting forensic dentist compare this newly acquired dental data with any available antemortem information. If no local match is found immediately, the information should be shared with other local, regional, and national agencies which are equipped to handle this type of data. A more detailed explanation of these programs is described below, under the heading "Search/ Comparison Programs".

07/95

Search and Comparison Programs

Purpose

In most cases the dental identification of unknown human remains is simply a matter of directly comparing the postmortem dental records with the antemortem dental records of a suspected individual. Another more difficult case scenario might involve the discovery of a body when a possible identity is not apparent. In these instances some type of evidence found at the scene or on the body is used.

One of the most difficult, but more important tasks that a forensic dentist can be asked to accomplish is the identification of unidentified remains when the investigators have no idea of the possible identity. There are no leads to follow or possible acquaintances to interview. Until the development of computer technologies, this task was all but impossible.

With the use of computer comparison programs the antemortem and postmortem information can be entered into a data base and thousands of comparisons can be made in seconds generating a list of possible candidates, which can then be confirmed or rejected by visual comparison of the appropriate dental radiographs and/or other dental evidence. For this to be a truly effective tool for law enforcement, appropriate dental search/comparison facilities must exist. Without a useable, up-to-date data base, the various search procedures can not be accomplished.

Minimum Requirements

The concept of a computer data base of dental information is not new; the National Crime Information Center (NCIC) at the FBI has the capability to receive dental information. The National Missing and Unidentified Persons database, NamUs that was established in 2009 is a web based system that is much more user friendly for law enforcement, medical examiners/coroners, victim advocates and the families of missing persons, than the NCIC system. Besides the demographics of the MUPs, biometric data can also be included in the record of an MUP, including dental radiographs, photographs, fingerprint and DNA data.

There are several issues that need to be considered when evaluating or establishing a “Search/Comparison” program.

- 1.** The computer software program must be easy to use and have the capability to perform general and specific searches and dental characteristic comparisons.
- 2.** The entry codes, forms, and procedures must be clear and uncomplicated, to reduce data errors.
- 3.** Law enforcement offices with authority to submit data must be educated concerning the use and value of the program.
- 4.** Mandatory reporting should be required of all law enforcement offices. It is clear to many who have experience with NCIC that the dental aspect of this program is not working effectively, as opposed to the NamUs system which has been proven to be effective and relatively easy to use. The problems and issues of the collection and entry

of dental data with the NCIC system were addressed by Haglund in an article entitled “The National Crime Information Center (NCIC) Missing and Unidentified Persons System Revisited”, *The Journal of Forensic Sciences* Volume 38, Number 2, March 1993.[5] Further problems with the search algorithms of the NCIC system were addressed in an article by Bell 07/95 “Testing of the National Crime Information Center Missing/Unidentified Persons Computer Comparison Routine”, *The Journal of Forensic Sciences*, Volume 38, Number 1, January, 1993. [6] The issues concerning the failures of NCIC are not the purpose or in the scope of these guidelines. Certainly, the NCIC system provides a valuable reservoir of information for law enforcement. But it is very possible that the scope of the dental aspect of the NCIC program is too large to be a workable data base.

Besides NamUs another location for “Search/Comparison” programs is at the state or regional level. The “ideal” state run program would have the following characteristics:

1. Established under the State Department of Law Enforcement or State Police/Patrol.
2. Run by a trained forensic dentist.
3. Mandatory reporting requirements for (1) missing persons, (2) unidentified bodies, (3) released felons, and (4) parole/probation violators.
4. Education program for local and state law enforcement, and coroners/ medical examiners.
5. Cooperation and sharing of data with neighboring programs.

Bibliography

[1] “Proceedings: First National Symposium on Dentistry’s Role and Responsibility in Mass Disaster Identifications”, American Dental Association, Chicago, Illinois, 1986.

[2] Lorton, L. and Langley, W.H., “Decision-Making Concepts in Postmortem Identification,” *Journal of Forensic Sciences*, JFSCA, Vol. 31, No.1, Jan. 1986, pp.190-196.

[3] American Board of Forensic Odontology, “Body Identification Guidelines”, *Journal of the American Dental Association*, Vol. 125, No.9, Sept. 1994, pp. 1244-1254.

[4] Jones, G.F., “A Simple Overlay System for Data Comparison in Dental Identifications,” *Journal of Forensic Sciences*, JFSCA, Vol. 33, Jan. 1988, pp. 254-259.

[5] Haglund, W.D., “The National Crime Information Center (NCIC) Missing and Unidentified Persons System Revisited”, *Journal of Forensic Sciences*, JFSCA, Vol. 38, No. 2, March 1993, pp. 365-378.

[6] Bell, G.L., “Testing of the National Crime Information Center Missing/

Unidentified Persons Computer Comparison Routine,” *Journal of Forensic Sciences*, JFSCA, Vol. 38, No.1, Jan. 1993, pp. 13-22.

07/95

WinID

History and development

The original Computer-Assisted Postmortem Identification (CAPMI) program was developed in the 1980s by Colonel Lew Lorton at the U.S. Army Institute of Dental Research. The program proved its usefulness in aiding identification procedures in the 1985 Gander plane crash. CAPMI was a DOS based computer program for PCs.

In 1990s personal computers were widely available and became more affordable. This was the year that Microsoft released Windows 3. It became clear that a user friendly dental computer identification program could be written. WinID was written in the Visual Basic (VB) programming language. The first two releases of WinID used a flat file for data storage.

WinID makes use of a graphical user interface and allows use of a mouse. WinID can store and display graphics in BMP, GIF and JPG file formats. Other Window’s features incorporated in WinID include text-boxes, list-boxes, combo-boxes, menus, scroll bars, buttons, check-boxes and radio-buttons.

WinID was first used in an incident involving two planes in Quincy, Illinois in 1996. The victims were recovered and examined; antemortem records received and reviewed; identifications made and final reports generated within 72 hours. This incident established WinID’s usefulness in mass disaster settings. This incident was the first response of a developing DMORT to an airline accident; the portable morgue was supplied by the National Funeral Directors Association.

WinID3 was released for use with the identification effort at the World Trade Towers in New York City in 2001. WinID3 incorporated the functionality of a Microsoft Access Database. WinID was able to handle the simultaneous challenge of the identification of victims of a Dominican bound American Airlines flight while the NYC Medical Examiner’s office continued with the aftermath of September 11th.

In the mid-2000s, WinID3 incorporated the ability to interface with digital radiographic equipment. This led to the concept of a paperless dental identification system, where all postmortem dental information such as dental charting, WinID codes, and digital radiographs and photographs are directly entered into the computer. The paperless system was successfully used in the Hurricane Katrina disaster.

WinID3 uses a Microsoft Access Data Base. A new database is used for each incident. WinID3 comes with a training database known as sample.mdb. This database contains records and

graphics from a small mass disaster and is used to familiarize novice investigators with computerized identification.

Each WinID3 database is composed of two tables: the antemortem table and the postmortem table. Each table holds either all the antemortem records or all the postmortem records for the incident. Each record is composed of fields. Examples of fields include: race, sex, height and primary code for tooth #4. Compilations and manipulations of data for report generation or research purposes can be handled either by WinID3 or by the use of the Microsoft Access program which is a component of Microsoft Office.

WinID Coding

WinID uses primary and secondary codes to classify individual teeth of a dentition. When using WinID it is important to remember that it is the restored surface of a tooth that is coded. The restoration itself is not coded. As an example a tooth with both MO and DO restorations is coded MOD and not MODO.

WinID Primary Codes

- **M** - mesial surface of tooth is restored.
- **O** - occlusal surface of posterior tooth is restored.
- **D** - distal surface of tooth is restored.
- **F** - facial surface of tooth is restored.
- **L** - lingual surface of tooth is restored.
- **I** - incisal edge of anterior tooth is restored.
- **U** - tooth is unerupted
- **V** - non-restored tooth – virgin
- **X** - tooth is missing - extracted
- **J** – The tooth is present but no other info is known.
Missing postmortem. Fractured crown. Avulsed tooth.
- **/** - no information about tooth is available.

WinID Secondary Codes

- **A** - Annotation - An unusual finding is associated with this tooth.
Specifics of the finding are detailed in the comments section.
- **B** - tooth is deciduous
- **C** - tooth is fitted with a crown. Shorthand for MODFL-C
- **E** - resin filling material.
- **G** - gold restoration.
- **H** - porcelain.
- **N** - non-precious filling or crown material. Includes stainless steel.

- **P** – Pontic: used only when tooth has been marked as missing with code “X”
- **R** - root canal filled.
- **S** - silver amalgam.
- **T** - denture tooth: used only when tooth has been marked as missing with “X”
- **Z** - temporary filling material. Also indicates gross caries (used sparingly).

Only the primary codes are used to rank records in WinID’s “best match” function. The secondary codes are used to help find records in WinID’s sorting and filtering functions.

In the best match mode WinID uses the primary codes to rank records. A specific postmortem record is compared to all the antemortem records on a tooth by tooth basis. An antemortem record can also be compared to all the postmortem records. When a tooth of one record is compared to a tooth of another record it is evaluated as: Hit, Miss, Possible or No-Information. A *Hit* is where there is a match such as an O code matching an O code. A *Miss* is where a comparison is not possible such as a postmortem V code compared to an X code. A *Possible* is generated when the postmortem record shows more dental work than the antemortem record, such as when an antemortem M is compared to a postmortem MOD. A *No-Information* is created when a / code is compared to any other code.

Running totals of the Hits, Misses, Possibles and No-Information are kept. It should be noted that for any specific comparison of one record to another record, the sum of the Hits, Misses, Possibles and No-Information will always equal 32.

After all the records are compared, the running totals are sorted to return ranked lists. WinID can return lists ranked by Most Hits, Least Miss Matches, Most Restoration Hits and Most Identifier Hits. Most identifier hits are generated from non-dental information such as age, race sex and blood type.

WinID will rectify any dental coding that is entered. The primary codes will be placed in an MODFL order, all entries will be capitalized, primary codes will be separated from secondary codes by a dash and extraneous entries such as numbers and punctuation will be removed. As an example when *q77mo@s* is entered WinID will return *MO-S*.

When coding for entry into WinID it is important to remember that records can be interpreted in many ways. The best coding will be coding that assures a record will achieve the highest placement in the best match function. Postmortem records are coded in a “what you see is what you code manner”.

Antemortem records are coded conservatively; radiographs are the best antemortem records. Written antemortem records should be used to confirm and amplify information seen on radiographs. It is better to use a / code for no-information, than to speculate and be wrong, thus moving the correct record further down the best match list. Always strive to minimize mismatches.

The coding team needs to be aware of some common errors that may place incorrect data into even the most meticulously kept records. *Flips* are where a restoration is placed in a tooth but the procedure is recorded as if it has been placed in the corresponding tooth on the other side of the mouth. An example is MO restoration placed in tooth #19 but recorded as #30-MO. *Flops* are where a restoration is placed in a tooth but the procedure is recorded as if a different restoration had been placed. An example is MO restoration placed in tooth #19 but recorded as #19-DO. *Slides* occur when a tooth is miss identified as a nearby tooth. This is usually due to extraction and subsequent mesial drift. A example of a slide is when tooth #19 had been extracted several years ago, the resultant space closed by mesial drift, then a MO restoration is placed in tooth #18 but recorded as #19-MO.

When the A secondary code is used an entry must be placed in the comments section. The entry is used to record information for which no appropriate code exists. The comments section is the institutional memory of the dental identification effort. To facilitate searching, a tooth number should be associated with each entry into the comments.

WinID has the ability to use standard codes. Standard codes can be thought of as key-words. A search would come back with no matches if a “pedo” entry was compared to a “primary tooth” entry. Standard codes eliminate this source of ambiguousness and are available by pressing the *Standard Codes* button on the comments page.

Installing and Using WinID3

WinID is currently available for download at abfo.org. WinID3 is was developed and written by James McGivney, DMD. Dr. McGivney had provided WinID via the winid.com website at no charge to anyone wishing to use it for many years and his generosity in sharing this valuable software to the forensic odontology community is unequalled. In 2014 he donated WinID to the ABFO to maintain and distribute it and it is now available as a free download at the ABFO website.

WinID3 will run under the XP, Vista, 7, 8 and 8.1 versions of the Windows operating system on PC type computers. Poor success has been reported with attempts to use WinID3 on MAC type computers emulating the Windows environment. No MAC version of WinID3 is contemplated.

To obtain WinID navigate your browser to abfo.org and follow the instructions on how to download and compete the end users license agreement, (EULA). .

It is best to use the default folder locations suggested by the WinID installation program. Using the default locations will ease networking WinID3 and create less problems when using others programs such as digital radiographic software.

When WinID3 is used in a network environment: Place the database (*.mdb) on the server. Install WinID3 on each workstation. Map the location of the database on the server to each workstation.

When WinID3 is installed, the program and other files are placed in a folder known as C:\program files\winid3\. These files are necessary for WinID3 to function properly and should not be modified or moved.

Other useful files can also be found in C:\program files\winid3\. These include four PowerPoint presentations on the uses of WinID, antemortem and postmortem coding forms, and English and Spanish versions of the user's manual.

Once WinID3 has been successfully been installed, navigate to C:\program files\winid3\, find the file *winid3.exe*, right click this file and select *create shortcut*. Drag the shortcut to the desktop.

To run WinID3 double click the shortcut icon on the desktop. Choose a database to use. The database sample.mdb is the only database available when WinID3 is first installed.

A new database should be used with each incident. To create a new database open the *File* menu, select *New Database*, type in a unique name for the new database, press *Open*. The new database will have one antemortem record and one postmortem record. Both records are named *Dummy*. Do not delete the Dummy records until actual antemortem and postmortem records have been added to the database.

When first opened, WinID3 displays two screens: the antemortem and postmortem screens. One or the other screen can be placed in front and thus becomes the current screen. To bring a screen to the front press its header bar or press either the *Ante* or *Post* button on the left menu.

Each screen is composed of several tabbed pages. To change tabbed page click the desired tab on the screen. The different tabbed pages include Name, Identifier, Dental Comments and Graphic. When the tabbed page is changed the record remains the same.

To navigate to a different record use the scroll bar at the bottom of the screen, or use the GoTo helper screen available on the left menu.

Information may be added into textboxes and combo-boxes on each of the tabbed pages of a record. This information is stored in a specific field of a specific record in the database. You can navigate to different fields by using the mouse or the tab button on the keyboard.

A graphic image can be associated with a specific record. Press the *Add Graphic* button found on the lower right of the Name tabbed page to add a graphic. Select a graphic from the list of displayed graphics. By default WinID3 expects all graphics to be placed in the C:\program files\winid3 folder. Once a graphic has been linked to a record, confirm it is the proper image by pressing the *Graphic* tab.

Use the *Add New* and *Delete Record* buttons on the left menu to add or delete records.

Press the NCIC 2000 button on the left menu to display the NCIC coding for the current record.

WinID3 can be displayed in various languages by selecting *Language* from the top *Display* menu.

Identification

WinID3 has a Best Match feature. Navigate to a record that you would like to identify. Make the record the front or current record. Press the *Best Match* button on the left menu. A screen with a number of ranked lists is displayed. The ranked lists display the best matches to the current record as calculated by various algorithms such as most hits and least mismatches. Double click on a record from any ranked list. A screen with three tabbed pages is displayed. Navigate through the tabs to display a comparison of identifier features, dental features or graphics.

Note the *Next Record* and *Previous Record* buttons at the bottom of the comparison screen. Use these buttons to move to the record that is below or above the displayed record from the ranked list. Scroll through records until a favorable comparison is found.

Antemortem and postmortem records can be filtered so that only records meeting specific criteria are displayed. Choose either the antemortem or postmortem screen. Press the *Filter* button at the bottom left of the screen. A screen with two tabbed pages is displayed. Enter desired filtering parameters and press *OK*. Only those records that pass the filter are displayed. The presence of the filter can be applied to the Best March function, so that only records that meet specific criteria are considered in the ranking algorithm. Be sure to turn off the filter when not needed, so that all records are available for use and display. In practice it is best to use a loose filter that allows more records to be selected than a tight filter that may exclude a critical record.

Another method of finding a match to a specific record is to persist a record's odontogram and graphic. This is accomplished by pressing the *Persist O+G* button on the left menu. Drag the persisted odontogram and graphic to a convenient location on your computer screen. If the record whose details have been persisted is antemortem filter the postmortem records and vice versa for a postmortem record. Use a prominent feature of the current record as the filter criteria. Display either the *Dental* or *Graphics* tabbed page of the filtered records. Now scroll through the records using the scroll bar at the bottom of the screen. Continue scrolling until a favorable comparison is made between the displayed odontograms or graphics.

Information about other features of WinID3 is available from the user's manual.

Currently a beta version of WinID on the Web is available for use at www.winid.com. It is hoped that in the future many features of mass disaster response, especially the interpretation and coding of antemortem dental records, can be accomplished at the computer. This will negate the necessity of bringing manpower to distant locations in response to a mass disaster.

Mass Fatality Incident Guidelines: The Development of a Dental Identification Team

Natural or man-made catastrophes often result in multiple casualties under circumstances that make their identification difficult. (1) It has long been recognized that under these circumstances, the use of dental records and x-rays by a team of trained forensic odontologists can greatly assist in the expeditious identification of the casualties. This facilitation of the identification and release of the victims to their families, not only provides a humanitarian service relieving the feelings of suffering and helplessness, but also satisfies several medico legal requirements. It is only a matter of time, when and where a mass fatality incident will occur. Based upon the significant role that forensic odontology has played in recent mass fatality incident response, it is the goal of the American Board of Forensic Odontology, Inc., to make available, to all who may have need, a simple but complete set of guidelines for the development of a dental identification team. Formal documentation of death demands positive identification. The degree of success in any mass fatality incident investigation is directly proportional to the degree of preparation. (2) These guidelines have been adopted as the official guidelines of the ABFO by unanimous vote of the diplomates, February 13, 1995, Seattle, Washington. A revision was completed in June 2010 by the MFI Subcommittee.

PURPOSE

These guidelines are designed as a resource for those agencies or jurisdictions who wish to develop an identification team either as a free standing unit or as a section of an overall mass fatality incident preparedness plan for a specific region. Realizing that no two mass fatality incidents are identical nor that the needs of all jurisdictions are the same, modification of any plan may be necessary. Based upon the combined experience of many diplomates with first-hand experience in the identification of multiple casualties, these guidelines are flexible. They provide a complete, but simple outline around which an organization can develop an identification team to suit its purposes.

TEAM DEVELOPMENT

Basic to any mass fatality incident identification team plan is the development of a concept of operation. How will your team function? Many states (3) have organized dental identification teams, some under the auspices of their state dental societies. The Council on Dental Practice of the American Dental Association has taken on the task of assisting and coordinating the activity. Will your team be integrated into an overall Emergency Government Plan for an entire state, or will it serve a county or region? Will your team be a part of a DMORT unit under the National Disaster Medical System? Understandably, all of these objectives may not apply in planning by prospective international teams outside the United States and Canada.

If trained odontologists are not available to form the core of the team, how will the training be accomplished? Will the team be dependent upon assistance from odontologists from other areas, or will it be free standing with the capability of handling all of its own functions? Once some of these questions are answered, those who are organizing the team can begin to consider the development of a plan, based upon five general areas:

1. Team personnel
2. Team organization
3. Equipment and supplies
4. Safety and health considerations
5. Facilities.

A bibliography in the addendum lists, as accurately as possible, many of the individual mass fatality incident dental identification team plans which are currently in print and available, together with a master list of all of the equipment and supplies which may be required in a mass fatality incident response. Consider that there is overlap between the odontologists, pathologists and funeral directors in the need for some of the equipment and supplies. Some of the equipment may be available from these sources and used jointly. Mutual aid agreements such as those which exist between the Disaster Dental Identification Teams in Illinois, Indiana, Michigan, Minnesota and Wisconsin may also be advantageous in the event of an extensive disaster.

OUTLINE OF A TEAM ORGANIZATION

I. Initial Organizational Planning

- A. Evaluate your need for a dental identification team
 1. Responsibility to the public
 2. Probability of an incident
 3. Existence of area or state teams
- B. Evaluate your resources for
 1. Trained dental personnel
 2. Equipment and supplies
 3. Financial assistance
 - a. State and local dental societies
 - b. State and local emergency management agencies
- C. Organizational implementation
 1. Team leadership
 2. Written organizational plan
 - a. Written participation agreement (4)
 - b. Written protocol with job descriptions
 - c. Flow chart for division of duties
 - d. Written record of participation and training
 - e. State and County Dental Associations
 - f. State Emergency Government Administration
 - g. State or local Medical Examiner/Coroner Office
 3. Sponsorship

II. Team personnel

- A. Source
 1. Diplomates of the American Board of Forensic Odontology
 2. Qualified odontologists
 - a. A nucleus of highly trained odontologist's is necessary to serve in a supervisory and instructional capacity

- b. The remainder of the team may be composed of dental personnel with skills in dentistry and limited training in forensic dentistry
- 3. Sufficient number of personnel
 - a. Consider your potential for a disaster and its' size, e.g.
 - (1) Major metropolitan area vs. small city or rural area
 - (2) International Jetport vs. local airport
 - (3) Presence of a geologic fault, volcano
 - (4) Reality of floods, hurricanes, or tornadoes
 - (5) Hazardous and explosive chemical industry
 - 4. Sources for personnel recruitment
 - a. Forensic organizations
 - (1) American Academy of Forensic Sciences
 - (2) American Society of Forensic Odontology
 - b. Dental societies
 - c. Dental schools faculty

Comment: *Dental students are not recommended for dental identification teams*

- 5. Additional resources
 - a. Armed forces Institute of Pathology, Department of Oral Pathology
 - b. National Disaster Medical Service, Disaster Mortuary Teams
 - c. Federal monetary assistance under Public Law 932.88
- B. Training resources
 - 1 .Initial training
 - a. Courses offered
 - (1) American Board of Forensic Odontology,
 - (2) Odontology section, AAFS
 - (3) American Society of Forensic Odontology
 - (4) University Dental Schools, Continuing Education Courses
 - (4) National and state dental meetings
 - (5) Various workshops and fellowships
 - b. Other resources
 - (1) Fire and rescue services locally
 - (2) DMORT annual training
 - (3) Hazardous Materials Teams (HAZMAT)
 - (4) Federal Bureau of Investigation Disaster Squad
 - c. Cost of training
 - (1) Individual's responsibility
 - (2) Sponsoring organization's responsibility
 - (3) Emergency government funds
 - 2. Scheduling of periodic continuing education or drills
 - a. Semiannual or yearly trainings are probably the most realistic
 - 3. Cross training of section members is highly desirable
 - 4. Objectives of training (5)
 - a. Familiarity with subject

- b. Understanding dental identification
 - (1) Antemortem problems and procedures
 - (a) Acquiring flight manifests and names
 - (b) Locating and securing dental records
 - (c) Problems with poor quality records
 - (2) Postmortem problems and procedures
 - (a) Gaining access to dental structures
 - (b) Obtaining postmortem radiographs
 - (c) Fragmentation and commingling
 - (3) Comparison section problems
 - (a) Coping with large numbers of records
 - (b) Computer versus manual searches
 - (c) Identification of fragmented and commingled remains
 - c. Learning to work with other identification specialists
 - (1) Fingerprint examiners
 - (2) Anthropologists
 - (3) Laboratory analysts
 - d. Become familiar with the concept of the Incident Command System-on line or through lectures
- D. Determination of the number of team members required
- 1. Based upon magnitude of the mass fatality incident
 - 2. The condition of the human remains
 - 3. Based upon number of shifts required (It is the consensus of experienced mass fatality incident response teams that working shifts, particularly the third, are to be avoided if at all possible. Normal working hours prove to be the least stressful.)
- E. Special skills required
- 1. Dentists with forensic training
 - 2. Oral surgeons, Oral pathologists
 - 3. Auxiliary personnel, Hygienists, Assistants for record compilation
 - 4. Computer assisted identification program specialists
 - 5. Psychologists trained in critical incident stress disorder (CISD)
 - 5. An experienced member to serve as a liaison with other sections of the investigative teams
 - 6. Amateur radio service operators for emergency communications
 - 8. Clergy
 - 9. Foreign language skills
- F. Staging area (may be the responsibility of emergency government; however the dental identification team should be familiar with this concept
- 1. Location
 - 2. Transportation of team personnel to the morgue site
 - a. Private vehicles
 - b. Buses, vans or four-wheel drive vehicles
 - 3. Access to the disaster area by dental personnel for the recovery of fragmental dental evidence

G. Legal considerations

1. Status of the team members as volunteers or employees
 - a. Worker's compensation or liability insurance to cover any injury or exposure
 - b. Responsibility for their health and safety
2. Compensation of the team members
 - a. Rate
 - b. Establishment of the rate according to experience, training and skill
 - c. Responsibility for the time and record keeping
 - d. Agency or underwriter responsible for payment
 - e. Team members should be informed of their probable compensation prior to participation
3. Consider a written agreement for team members (7)
 - a. Rules and regulations for participation
 - (1) Authorized photography only
 - (2) Authorized press interviews only by official spokesperson
 - (3) Procedure for activation and participation
 - b. Responsibilities
 - (1) Participation in continuing education
 - (2) Obligation to report changes in telephone or address
 - c. Code of ethics
 - (1) Nondisclosure of privileged information
 - (2) Report to staging area only when activated
 - (3) No unauthorized contact with the media
4. Written authorization from Coroner or Medical Examiner to conduct a limited autopsy
 - a. Method to gain access to the teeth
 - (1) Viewable versus non-viewable cases
 - (2) Specific authorization for removal of jaws
 - b. Written authorization for the retention of any tissue

H. Jurisdictional considerations

1. Conflict of any of the identification team guidelines with an existing emergency government disaster plan
2. Limitation of the team's area of operation
3. State or governmental licensure considerations applicable
4. Mutual aid agreements already in effect for other dental identification teams

I. Mobilization procedure (activation)

1. Method for both drills and actual notification
 - a. Phone tree
 - b. Fax
 - c. Computerized notification system

- d. One individual solely responsible for placing all calls for activation is recommended:
 - (1) Ability to confirm the team member's availability
 - (2) Ascertain the duration of assignment the team member can accept
 - (3) Assign a specific time to report or duty to be performed
- 2. Periodic update of telephone numbers and phone drill
 - a. Annually should be the minimum to keep records current
 - b. More frequently is desirable
- 3. Determination of which team members are to be activated
- J. Security and identification of authorized team personnel
 - 1. Photo identification cards
 - 2. Distinctive colored baseball caps
 - 3. Distinctive colored protective equipment
- K. Team organization / structure
 - A. Can be divided into sections for specific training and duties
 - 1. Antemortem records section
 - 2. Postmortem, photography and x-ray section
 - 3. Comparison section
 - B. Size of sections determined by magnitude of catastrophe
 - C. Team leader, alternate team leader and section supervisors on call 24 hours at a time to effectively be able to activate the team
 - D. Units of the team can be organized regionally
- L.. Equipment and supplies (a complete listing is found in the addendum)
 - A. Equipment
 - 1. Dental X-ray unit(s)
 - 2. Dental instruments
 - 3. Autopsy equipment (available from Medical Examiner or Coroner office)
 - a. Bard Parker handles and blades
 - b. Stryker saw or bone cutters
 - c. Gurneys and tables
 - 4. Digital radiography and computer software, sensors
 - 5. Lighting (available from emergency government)
 - 6. Photographic equipment, digital cameras and flat bed scanners
 - 7. Computer hardware and software useful for large numbers of casualties
 - 8. Copy machine(s) and paper
 - 9. Consider having a back-up available for all equipment. (Redundancy is the hallmark of an excellent disaster plan-Murphy's Law)
 - B. Immediate availability of supplies and equipment
 - 1. Prior arrangements in place with potential suppliers are essential
 - a. Evenings, weekends and holiday contact numbers
 - b. Consider an alternate source just in case

- c. Advance financial arrangements eliminate the need for cash at the time of procurement
- 2. Annual review of equipment needs and contact numbers of personnel authorized to provide emergency use of the equipment or provide the supplies must be accomplished
- C. Supplies (Exact items required and quantity will be determined by the individual team resources and needs. Remember that some supplies have a limited shelf life and must be replaced periodically)
 - 1. Batteries for cameras, photographic paper and printers for digital radiographs
 - 2. Dental charts (standardized format), manila envelopes, magic markers and colored pencils
 - 3. Rubber gloves (heavy duty); rubber aprons and face masks and shields or eye protection
 - 4. Protective footwear (rubber boots)
 - 5. Banker boxes for files
 - 6. Quantity of supplies is driven by the number of casualties
 - 7. Foot lockers or storage boxes for small equipment
 - 8. Responsibility for cleaning and sterilizing and returning instruments and equipment
 - 9. Responsibility for restocking supplies used
- D. Consider the other agencies involved as a resource for equipment and supplies.
 - 1. Medical Examiner or Coroner
 - 2. DMORT utilizing one of three LRAT (Logistical Response Assistance Teams) – Can deploy the DPMU (Disaster Portable Morgue Unit), providing equipment and supplies upon activation
 - 3. Fire and Rescue Service
 - 4. Emergency Government Coordinators
- E. Clean-up, storage and restocking of equipment and supplies
 - 1. Cleaning and sterilization of equipment can be accomplished by:
 - a. Local hospitals as a public service
 - b. Medical Examiner facilities
 - 2. Storage location between mass fatality incident responses (must be accessible at all times)
 - a. Airport warehouse facility
 - b. Emergency Government facility
 - c. Medical Examiner Office
 - 3. Responsibility for restocking supplies
 - a. Coroner or Medical Examiner
 - b. Emergency Government Office
 - (1) County
 - (2) State

(3) National-Federal Emergency Management Agency
(FEMA)

c. The identification team

M. Safety and health of team members must be considered

A. OSHA regulations in the United States and WHIMS Rules in Canada.

Other regulations may apply internationally.

1. Team leaders must be aware of their responsibilities
2. Team leaders and team personnel must be properly trained and are aware of:
 - a. Radiologic hazards
 - b. Blood borne pathogens
 - c. Toxic chemicals
 - d. Hazardous debris
3. Team members must receive biologic hazard and blood borne pathogens training annually and be documented
4. A written plan and record of periodic training must be maintained
5. Avoid long hours or shifts (8)
 - a. Increases in critical incident stress
 - b. Increases in mistakes and accidents
 - c. Doesn't allow for cleaning the morgue site
 - (1) Safety and hygiene
 - (2) Professional appearance deteriorates

B. Immunizations

1. Immunizations should be required for:
 - a. Tetanus
 - b. Hepatitis B
 - c. Special situation immunizations for foreign locations
 - d. Tuberculosis
2. Cost borne by the sponsoring organization
3. Are health and immunization records kept and updated per OSHA regulations

C. Protective gear for personnel is a necessity

1. Team members must be trained in the use of this equipment (F.I.T. testing)
2. Protective equipment must be immediately available
 - a. Agency responsible for providing the protective equipment
 - b. Storage location
 - c. Responsibility for disbursing and maintaining it

D. Psychological debriefing and counseling should be available. Since this is a situation common to all disaster workers, it ordinarily is not the responsibility of the dental identification team to arrange for this service. However, dental team members should be aware that their work can be psychologically taxing.

1. Access to experts in post-traumatic stress counseling
2. Access to clergy

N. Facilities (Although this is the responsibility of the Coroner or Medical Examiner, many smaller jurisdictions have never experienced a catastrophe involving mass fatalities. It should, therefore, be considered by the experienced dental identification team, since they may provide valuable advice.)

- A. Adequate temporary morgue sites must be selected in advance
 1. All Coroner/Medical Examiner offices do not have a written disaster plan in place, so potential sites may not be in place
 2. Experienced odontologists may be able to assist them in developing this plan, because of their prior experience
 3. In general it is advantageous to plan for the use of existing facilities to their maximum before setting up a temporary morgue.
- B. Alternate sites also should be considered as a back up
- C. Sanitation facilities must be available at all of the potential sites
 1. Hot, running water and soap
 2. Toilets and toilet paper
- D. Arrangements for food and a rest area for team members
 1. Sources for food and drink
 - a. Salvation Army volunteers
 - b. Red Cross volunteers
 - c. Volunteers (e.g., service clubs, churches)
 2. Consider the maximum length of time a team member may work
 - a. This work is stressful
 - b. Be aware of post-traumatic stress disorder
 - c. Provide for mandatory periodic breaks
 - d. Rest in an area removed from the morgue is essential
 3. Consider rotating team members between sections frequently
 4. Provide chairs or stools for use of team members while working
 5. Standard working hours are the least stressful. Avoid shifts.
- E. Immediate reservation of blocks of hotel or motel rooms by the office of emergency government, or other authorized agency, for the use of disaster personnel is necessary to prevent the media from tying up all of the rooms available for miles around.
- F. Area perimeter security is the responsibility of the ranking law enforcement official present. However, the dental team must be aware of the necessity for perimeter security and be readily identified.
 1. Protection of personal effects of victims
 2. Excluding the curious and unauthorized
 3. Prevention of unauthorized photography by the media
 4. Can be provided by governmental or private agencies

Once these concepts have been established, those organizing the team can begin to consider expansion of the team to handle the identifications, as the magnitude of the disaster increases (9). The team can then be organized to be able to handle casualties in ranges, e.g. 1 to 50, 50 to 150, 150 to 300 and 300+ (10). Working in shifts, around the clock, can be accomplished when necessary by the use of cross-trained supervisory personnel for each shift.

ADDITIONAL RESOURCES

The following references contain information on mass fatality incident dental identification team plans and although this listing is not comprehensive, it is provided as a source of additional information for those who may wish to research.

American Dental Association, *Proceedings, First National Symposium on Dentistry's Role and Responsibility in Mass Disaster Identification*, Chicago, Illinois.

Bell, G. L., *Manual of Forensic Odontology*, Chapter 7, Mass Disaster Dental Identification, published by the American Society of Forensic Odontology.

Besant-Matthews, P. E., *Report of the Delta 19 Aircraft Crash, Dallas, Texas, 1985, Disaster, Planning Checklist*

Braggeman, W., Durigon, M., and Keiser-Nielson, S., *Manual on Disaster Victim Identification*, International Criminal Police Organization - Interpol, 4.4.2.5, Dental ID Section.

FEMA, *Multiple Fatalities Disaster Response*, Student Manual, Emergency Management Institute, National Emergency Training Center, Emmitsburg, Maryland

Glazer, H. S., Editor, *Forensic Dental Team Identification Manual*, The Dental Society of New York, 1989.

Hazen, R. I. and Phillips, C. E., *Field Disaster Identification. Preparation- Organizational Procedures*, U.S. Department of Justice, Federal Bureau of Investigation

Johnson, L. T. and Simley, D. O., *Wisconsin Dental association Disaster Identification Team*, Milwaukee, Wisconsin, 1984

Morlang, W. M., *Mass Disaster Identification*, U. S. Air Force Medical Service, Brooks Air Force Base, San Antonio, Texas, 1993

Standish, M. and Cottone J., *Outline of Forensic Dentistry*

Warnick, A., *Forensic Dental Identification Team Manual*, The Michigan Dental Association, Lansing, Michigan, 1989

Wisconsin, State of, *State Statutes, Chapter 166, Emergency Government*

Wright, F. D., *Mass Disaster Dental Identification Team*, Ohio State Dental Association

Bibliography:

1 Field Disaster Identification, Preparation-Organization-Procedures, U.S. Department of Justice, Federal Bureau of Investigation, Hazen, R. J. and Phillips, C. E.

2 Mass Disaster Management, Morlang, W. M., U. S. Air Force Medical Service, Brooks Air Force Base, San Antonio, TX, 1993

3 The State of Washington was the first with a written plan developed by Dr. Gary Bell, *Mass Disaster Dental Identification Team*, 9730 Third Ave., NE, Suite 204, Seattle, WA 98115, 1983

4 Ohio State Disaster Dental Identification Team, Franklin Wright, DMD

5 Idaho State Dental Association Disaster Dental Identification Team Protocol, Gerald F. Jones, DDS

6 Ohio State Disaster Dental Identification Team, Franklin Wright, DMD

7 Personal communication, Greathouse, Danny W., FBI Disaster Squad

8 Personal communication, Greathouse, Danny W., FBI Disaster Squad

9 Mass Disaster Management, Morlang, W. M., U. S. Air Force Medical Service, Brooks Air Force Base, San Antonio, TX, 1993

10 Compiled from "Mass Disaster Management", U. S. Air Force Medical Service, Brooks Air Force Base, San Antonio, TX, Morlang, W. M., 1993, and from suggestions from the committee members and those Diplomates of the American Board of Forensic Odontology who attended the workshop on mass disaster team guidelines held at Seattle, Washington, February 13, 1995.

11 Cook County Medical Examiner Disaster Identification Team Protocol, John Kenney, DDS, MS

06/10

CHECKLIST OF SUPPLY AND EQUIPMENT REQUIREMENTS

Consider that other agencies or teams responding to a mass fatality incident investigation may also have need for the same supplies and equipment. The possibility of mutual use may exist, and the security of having a back-up unit is extremely valuable when a break down occurs. A frequently updated list of emergency contact personnel with telephone numbers of dental supply houses and other sources of equipment and supplies must be maintained. Specific responsibility for this task must be assigned to an individual team member.

Autopsy (Postmortem) Section Equipment and Supplies

Pruning shears (long handle)
Folding tables/chairs
Mallet & chisel
Plastic aprons
Surgical masks
Pm dental charts
Photo id badges
Gurneys
Dental mouth mirrors
Lead aprons
Lead gloves
Cheek retractors
Modeling clay
Large Ziploc bags
Molt mouth prop
Shoe covers
Flood lights
Extension cords
Surgical head covers
Fans
Surgical scrub soap & brushes
Bard parker handles/blades
Plastic gallon jugs
Hydrogen peroxide
Toilet paper
Large hemostats
Autopsy twine
Scrub suit trousers (s-xl)
Bite blocks
Flash lights/batteries
Tongue depressors
Plastic squeeze bottles
Ball point pens
Sharpie felt tip markers
Isolation gowns rubber gloves
4 x 4 gauzes

Blue paper towels
Goose neck lamps
Moveable partitions
Dental explorers
Handheld or portable dental x-ray unit
Orange oil
Toothbrushes
Cyanoacrylate cement
5-gallon plastic pails
Plastic (Saran) wrap
Digital Cameras
Laptop computer(s) with digital x-ray and WinID3 software, LCD monitors
Digital x-ray sensors
Sensor holders (Rinn and XCP)

Comparison Section Equipment and Supplies

Folding tables and chairs
Tooth development (Chart)
Millimeter Rule
X-ray view box
Large manila envelopes
Tape, masking & surgical
Paper clips
Standard dental charts
Banker file boxes
Camera batteries
Clip boards
Odontology texts
File folders
ASFO Workbook Manual
FAX machine
Telephones
Computer(s)/ID software, printers, flatbed transparency scanner(s) etc.
Legal pads
Clip boards
Rubber bands
Labels, self-adhesive
Telephone directories
Tool box and tools
Extension cords
Magnifying glass
Staplers and staples
ADA Membership Directory

Dental School Curriculum Guidelines for Forensic Odontology

I. Preamble

These curriculum guidelines for the teaching of forensic odontology in dental school pre-doctoral programs are the work of the American Board of Forensic Odontology, Inc. (ABFO). The ABFO is recognized by the American Academy of Forensic Sciences as a specialty organization that offers board certification to its members. One of the purposes of the Board is to encourage the study of, improve the practice of, establish and enhance standards for, and advance the specialty of forensic odontology. Although the guidelines are recommendations, their use as course development aids is suggested by official ABFO policy.

The guidelines were developed by the ABFO's Ad Hoc Dental Student Curriculum Committee and were approved by the ABFO Board of the Directors and membership in February, 2006. The members of the committee consisted of the following:

Richard A. Weems, DMD, MS, DABFO (chair)
Veronique F. Delattre, DDS, DABFO
David R. Senn, DDS, DABFO
David Sweet, DMD, PhD, DABFO

II. Introduction

The objective of the guidelines is to delineate pertinent topics and basic content of teaching that will provide an optimal educational experience in the field of forensic odontology. It is recognized that individual dental schools' policies, philosophies, and curricular structures will vary and therefore so will the amount of time and weight that is afforded to this subject.

Also, forensic dentistry interrelates with most of the fields of dental study including anatomy, radiology, embryology, oral pathology, biomaterials and the various restorative sciences. Therefore, it is recommended that the teaching of this material be conducted in the latter part of the dental students' educational program.

III. Recommended Core Content

The core content of a course of study in forensic odontology should include:

- A. Description of Forensic Odontology
 1. Definition and derivation of the word "forensic".
 2. Common tasks involved in forensic odontology and their relationship to the judicial system.

- B. History of Forensic Odontology
 1. Beginning and evolution of coroner/medical examiner systems
 2. Pioneers in forensic odontology

3. Early textbooks on the subject
4. Historic identifications through dental records
5. Creation of current forensic organizations and agencies

C. The Judicial System

1. Principles of criminal law proceedings
2. Principles of civil law proceedings
 - a. Contract law
 - b. Tort law
3. Elements required for malpractice and negligence
4. Adversarial system
5. Common legal terms and definitions
6. Expert witness activities and guidelines
7. Procedures of Grand Juries or Preliminary Hearings
8. Hard vs. soft evidence
9. Chain of custody of evidence
10. Professional negligence peer review process
11. Admissibility of scientific evidence and landmark cases
 - a. Requirements of the scientific method
 - b. Kelly-Frye Rule
 - c. Federal Rules of Evidence (FRE-702)
 - d. Daubert vs. Merrell Dow Pharmaceuticals
 - e. Kumho Tire vs. Carmichael

D. Medicolegal Investigations

1. Definition of clinical time of death
2. Categories of deaths requiring a medico-legal autopsy
3. Objectives of a medico-legal autopsy
 - a. Cause of death determination
 - b. Mechanism of death
 - c. Manner of death
 - i. Natural causes
 - ii. Accidental
 - iii. Homicide
 - iv. Suicide.
 - v. Undetermined
 - d. Contributing factors to cause of death
 - e. Scientific basis of victim identification
 - f. Collection and presentation of evidence for the courts
4. Steps and procedures of a complete medicolegal autopsy
 - a. Tissues examined
 - b. Tissues and fluids collected
5. Characteristics of postmortem changes/Time since death
 - a. Livor mortis
 - i. Tardieu spots

- ii. Cherry-red lividity
- iii. Periorbital petechial spots
- iv. Pink teeth
- b. Rigor mortis
- c. Algor mortis
- d. Vitreous potassium
- e. Process of decomposition
 - i. Autolysis
 - ii. Putrefaction
 - iii. Saponification/Adipocere
 - iv. Mummification
 - v. Skeletalization

E. Age, Sex and Race Determination

1. Reliability and variability of methods
2. Age estimation
 - a. Dental techniques
 - i. Massler and Shour
 - ii. Ubelaker
 - iii. Gustafson method
 - iv. Gustafson and Koch
 - v. Bang and Ramm
 - vi. Moorees, Fanning and Hunt
 - vii. Burns and Maples
 - viii. Demirjian
 - ix. Mincer, Berryman and Harris
 - x. Histological disturbances in enamel and dentin
 - xi. Lamendin
 - xii. Aspartic acid racemization in dentin and enamel
 - b. Anthropological
 - i. Ossification centers
 - ii. Pubic symphysis
 - iii. Osteoarthritic lipping
 - iv. Cranial suture closure
3. Sex determination
 - a. Dental
 - i. Morphology of teeth and maxillofacial structures
 - ii. Barr bodies
 - iii. Amelogenin
 - b. Anthropological
 - i. Pelvic morphology
 - ii. Skull morphology
4. Race determination
 - a. Dental
 - i. Alveolar size and prognathism

- ii. Arch size and shape
 - iii. Tooth characteristics of races
 - b. Anthropological
 - i. Orbital morphology
 - ii. Nasal morphology
 - iii. Zygomatic arch
 - iv. Supraorbital morphology
 - v. Gonion angle and prognathism
- 5. Other techniques of age determination
 - a. Amino acid racemization (non-dental)
 - b. Serology
 - c. Metallic ratios

F. Human Identification

- 1. Scientific modes of identification
 - a. Fingerprint
 - b. Dental
 - c. Medical
 - d. Anthropological
 - e. DNA
- 2. Types of remains
 - a. Viewable
 - b. Non-viewable
- 3. Types of dental evidence
 - a. Antemortem
 - b. Postmortem
- 4. Radiology concerns with forensic specimens
 - a. Projection geometry
 - b. Beam energy reduction
 - c. Digital radiography
 - d. Hand-held x-ray devices
- 5. Dental autopsy techniques
 - a. Resection
 - b. Facial flap
 - c. Inframandibular
- 6. Tissue preservation
 - a. Hard tissue
 - b. Soft tissue
- 7. Dental-related comparisons
 - a. Missing, extracted and restored teeth
 - b. Tooth morphology
 - c. Non-tooth related findings
 - i. Sinus pattern
 - ii. Rugoscopy
 - iii. Chieloscopy

- iv. Removable dental appliances
 - 8. DNA comparison
 - 1. DNA theory and terminology
 - 2. Polymerase Chain Reaction (PCR) and STR's
 - 3. Mitochondrial DNA (MtDNA) sequencing
 - a. Pedigree
 - 4. Automated comparison kits
 - 5. Dental DNA harvesting and storage
 - a. Tooth sectioning
 - b. Cryogenic grinding
 - 9. ABFO degrees of certainty of dental identification
 - a. Positive identification
 - b. Possible identification
 - i. Consistent, no unexplained discrepancy
 - ii. Poor quality of remains or antemortem evidence
 - c. Insufficient
 - i. Insufficient evidence to form an opinion
 - d. Exclusion
 - i. Clearly inconsistent findings
 - 10. Missing persons networks
 - a. Federal Bureau of Investigation
 - b. National Crime Information Center (NCIC 2000) and Canadian Police Information Centre (CPIC)
 - c. Automated Fingerprint Identification System (AFIS)
 - d. Combined DNA Index System (CODIS)
 - e. U.S. Army Central Identification Laboratory (CILHI)
 - f. Interpol
- G. Victim Identifications in Mass Fatality Incidents
- 1. Federal assistance
 - a. Public Law 93-288
 - b. Family Assistance Act of 1996
 - 2. Disaster assistance
 - a. FBI
 - b. FEMA
 - c. NTSB
 - d. NDMS
 - e. DMORT
 - 3. Dental team divisions
 - a. Antemortem team protocol
 - b. Postmortem team protocol
 - c. Comparison team protocol
 - d. Information management
 - 4. Stages of victim documentation
 - a. Login/assign escort

- b. Personal effects
- c. Photography
- d. Radiography
- e. Pathology/Medical Examiner
- f. Anthropology
- g. Fingerprint
- h. DNA
- i. Dental
- j. Mortuary services
- 5. Common tooth numbering systems
 - a. Universal
 - b. Palmer
 - c. FDI- Federation Dentaire International
- 6. Computer-aided dental identification
 - a. CAPMI
 - b. WinID
 - c. DIP-2
 - d. Toothpics
 - e. D.A.V.ID
 - f. Primary and secondary dental sorting codes
 - g. Integration with digital radiography and photography
- 7. Management of team personnel
 - a. Team approach
 - b. Cumulative stress prevention and signs

H. Bitemark analysis

- 1. History of bitemark legal citations
- 2. Distinction between incisions and lacerations (blunt trauma)
- 3. Methods and variability of bitemark bruising and aging factor
- 4. Bitemark descriptive terms
 - a. Class characteristics
 - i. Shape
 - ii. Size
 - iii. Pattern
 - b. Individual characteristics
 - i. Arch characteristics
 - ii. Dental characteristics
 - c. Central ecchymosis
 - d. Linear abrasions
 - e. “Double bite” or multiple bites
 - f. Avulsion
- 5. Evidence collection and exemplars
 - a. Landmark legal citations
 - b. Characteristics of contusions and lacerations
 - c. Bitemark evidence protocol

- i. Double swab for salivary DNA
- ii. DNA preservation
- iii. Photograph injury
- iii. Soft tissue impression
- iv. Tissue excision and preservation
- d. Photography
 - i. ABFO ruler
 - ii. Geometric distortion and parallax
 - iii. Visible light technique
 - iv. Alternative light techniques/sources, films and filters
- e. Suspect evidence protocol
 - i. Legal consent
 - ii. Impression requirements
 - iii. Study cast requirements
 - iv. DNA collection
 - v. Extraoral and intraoral exam
 - vi. Bite registration
 - vii. Excursion measurements

6. Bitemark analysis and comparison

- a. Metric analysis
 - i. Teeth
 - ii. Arch
 - iii. Bite opening distance
- b. Pattern association
 - i. Hollow volume transparencies
 - ii. Full volume transparencies
 - iii. Digital enhancement and superimposition
 - iv. Test bites
 - v. Transillumination
 - vi. Scanning electron microscopy
- e. ABFO guidelines-confidence of existence of a bitemark
 - i. Bitemark
 - ii. Suggestive of a bitemark
 - iii. Not a bitemark
- f. ABFO guidelines-confidence of link to suspect
 - i. The Biter
 - ii. The Probable Biter
 - iii. Not Excluded as the Biter
 - iv. Excluded as the Biter
 - v. Inconclusive

I. Domestic Violence and Neglect

1. Statistics of Domestic Violence and Deaths

a. Child abuse

- b. Spousal abuse
- c. Elder abuse
- 2. Mandated reporting by the practitioner
- 3. Protection for reporters of abuse
- 4. Signs of abuse and neglect
 - a. "Battered child syndrome"-Kempe, 1962
 - b. Battle sign
 - c. Raccoon eyes
 - d. Retinal hemorrhage and displacement
 - d. Labial frenum tear
 - e. Scalding with spared areas
 - f. Broken and unrestored teeth
 - g. Angular abrasion
 - h. Lack of response to environment
 - i. Various neurosis and psychosis
 - j. Signs of trauma without reasonable cause
- 5. Organizational support
 - a. Prevention of Abuse and Neglect Through Dental Awareness (PANDA-Delta Dental)
 - b. Department of Human Services
 - b. Child Protection Services
- 6. Conditions simulating child abuse and neglect
 - a. Various forms of disease, malnutrition and pathology
 - b. Mongolian spot
 - c. Cao gio
 - d. Moxibustion

2/2006

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- 3. Denise Murmann
- 4. David Senn
- 5. Holland Maness
- 6. Eric Wilson
- 7. Jim Lewis
- 8. Jacqueline Reid
- 9. Peter Marsh
- EC Liaison- Adam Freeman

Metrology

- Tom David- Chair (18)
- EC Liaison- Roger Metcalf

Public Relations

1. Bruce Schrader- Chair (17)
2. Richard Fixott
EC Liaison- Jim Lewis

Ad Hoc Committees

Ad Hoc Image Series IV

- Jackie Reid- Chair (18)
Joe Adserias

Ad Hoc Archives

- Warren Tewes- Chair (17)

Ad Hoc Local Arrangements

- Gary Bell (17)

Ad Hoc ADA Liaison

- John Kenney (17)

Ad Hoc ADA Scientific Committee for Dental Informatics (SCDI)

- Bob Barsley (17)

Ad Hoc FSAB Liaison

- David Senn (18)

Ad Hoc FSAB recertification

- Peter Loomis – Chair (17)
David Senn – consultant

Parliamentarian – Bob Barsley (15)

Webmaster – Dane Johnson

ABFO Awards

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Haskell Pitluck Award

This award is given to a non-odontologist that has served the ABFO community in an exemplary fashion. The first recipient of this award is the namesake of the award, Judge Haskell Pitluck, who has served the ABFO selflessly, with great passion for many years. This first Haskell Pitluck award was bestowed to Judge Pitluck on 02/20/2012.

This Award will be given in the future at the discretion of the ABFO Board of Directors to a worthy recipient.

February 20, 2012
February 18, 2013
February 17, 2014
February 15, 2015

Judge Haskell Pitluck
William Hyzer
Candy Ross
Stephen Kinney

John M. Williams Humanitarian Service Award

John Williams Humanitarian Award To be given to an forensic odontologist whenever appropriate who exemplifies humanitarian service in the spirit of Dr. John M. Williams, the first award to be given to Dr. John Williams posthumously.

This Award will be given in the future at the discretion of the ABFO Board of Directors to a worthy recipient.

February 17, 2013

John M. Williams, DDS