**Dental age estimation of unaccompanied minors as a part of human rights protection in Europa**

the quest for victim identification. This presentation will deal with the use of an ultra-violet light source to detect fluorescence in certain composite resins or sealants.

This presentation will impact the forensic science community by encouraging the forensic odontologist to be aware of the various investigative modalities available.

The forensic odontologist may not be able to identify every victim he or she encounters due to a multitude of reasons. It is indeed unfortunate when a lack of complete antemortem records will often preclude the certification of a dental identification. Sometimes, however, a relatively small amount of dental information can contribute to a positive identification when considered along with information gleaned from other disciplines. The following case is an example of such an identification; what is particularly unique is that the dental information was ascertained by the use of an ultra-violet light source.

The case involved four victims of a suspicious house fire; later confirmed by the fire marshall as arson. The victims were believed to be members of the same family and included a mother, a teenage son, and two pre-teen daughters. The husband/father in this family was at work when the incident occurred. A complete postmortem dental examination on the adult female was performed and a dental chart with a full mouth series of radiographs was generated. These records were compared to the antemortem dental records supplied by the family dentist. Based on this examination and comparison of both post and antemortem records a positive dental identification of the adult female was established.

The medical examiner had ordered an evaluation of mitochondrial DNA on the victims and it was determined that all the individuals shared the same mDNA. Based on this laboratory finding coupled with the positive dental examination of the mother, the medical examiner concluded that the three children were indeed members of the same household.

A postmortem dental examination of the teenage male victim was performed and a dental chart was produced. Because this victim did not have any antemortem dental records available, a dental identification was impossible. Due to the consistencies of the forensic evidence surrounding this individual, such as age estimation, location at the scene, gender, jewelry, and mDNA a positive identification was deemed credible.

The two young girls presented a different situation. Because of the closeness in their ages there was no significant dental evidence to accurately separate them by the usual age determination techniques. Both victims' mandibles were locked in a slightly open position with approximately 15mm measured at the central incisors. For various reasons resection of the jaws was not an option. No restorations were visible on either victim. Both had been seen by a dentist but there were no radiographs taken and restorative charting had not been done. The records did indicate however that an occlusal sealant was placed on tooth #14 on Girl Victim #1 and an occlusal sealant had been placed on tooth #3 on Girl Victim #2. Examination with a #23 explorer was difficult and inconclusive. Utilizing the properties of Ultra Violet light examination espoused by Guzy et al, the fluorescence observed was consistent with the dental record. With this information Girl Victims #1 & #2 could be tentatively identified.

While these consistencies afforded a "probable" dental identification it was considered prudent that a "positive" dental identification could not be certified based on this one parameter alone. This information when coupled with the mDNA match resulted in giving Girl Victims #1 and #2 their proper names.

**UV Light, Fluorescent Resins, Probable Identification**

## F44 Dental Age Estimation of Unaccompanied Minors as a Part of Human Rights Protection in Europe

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After attending this presentation, attendees will have an understanding of some of the procedures used in European countries for age estimation of unaccompanied minors.

This presentation will impact the forensic science community by showing the importance of age assessment for protection of human rights.

The increase in migratory flows in Europe, and the subsequent complexities resulting from them taken in the broader context of globalization, has revealed a number of problems, such as the protection of human rights, identification of those with the right to apply for refugee status, and the age estimation of unaccompanied minors. Unaccompanied asylum seekers deemed to be under 18-years-old face a very different path through the immigration system from that followed by adults. Generally, adults are subject to immediate deportation or detention in jail. Minors are processed through the juvenile system, where detection is not mandatory; they will often have access to educational programs and may be granted a residency permit. The assessment of chronological age is notoriously difficult. Age assessment is particularly difficult for those who are aged between 15 and 20 years, yet it is precisely this age group where the assessment of age and the outcome of the process is most critical.

In this context dental age estimation methods have proved versatile and are used effectively in various European countries facing the problem of illegal immigration. The purpose of this presentation is to show different examples of dental age estimation through case studies, where odontologists played a major role in age assessment. A review of six unaccompanied asylum seeker/refugees cases from Iceland, Italy and Serbia are presented.

**Case 1:** Presents a case in Iceland which was requested by Icelandic Directorate of Immigrants. A male from Albania insisting to be 16-years-old, was found to be over 20.

**Case 2:** Presents a case in Iceland which was requested by Icelandic Directorate of Immigrants where a female from China claiming to be 17. Estimates confirmed the probability that the she was the age claimed, given the standard deviation. Kullman (1992), Mincer (1993) and Haavikko (1970) dental age estimation methods were employed.

**Cases 3 & 4:** Presents two cases in Italy which were requested by Immigration Police authorities and Judges. A male from Nigeria and a male from Iraq, both claiming to be minors. Relying on skeletal maturation as seen on an x-ray of the wrist, iliac crests, and dental panoramic (Harris, 1984; Kullman, 1992 and Moorrees, 1963), together with background information and external examination of each individual, only case two proved to be under 18.

**Cases 5 & 6:** Presents two cases from Serbia requested by Serbian NGO "Praxis." The cases examined regard two refugees from Kosovo who escaped after NATO bombing in

1999. In both cases, tables by Kahl & Schwartz (1988) Mincer (1993), Olze (2003), Orhan (2007), Gunst (2003), and from Smith (1991) were employed by an odontologist to verify the real year of birth in order to issue proper identification documents. The experts' report was based on the recommendations of Forensic Age Estimation Study Group of the German Association for Forensic Medicine including anthropometric measures and radiological analysis of the wrist. The age claimed was confirmed by the procedures.

The presentation does not attempt to give a definitive account of the different scientific methods for the assessment of age, but age estimation of unaccompanied minors is a fundamental principle of human rights and dignity. A possible increase in the accuracy of age estimation process can only be achieved by using multiple age estimation parameters. In order to achieve and maximize the effectiveness of the age assessment process, implementation of international standards through a technical table with the political will is needed. Nevertheless, more observational data in the countries where refugees come from and a synergy between medical examiners and odontologists is needed, in order to assess the correction parameters to be used in dental age estimation formulas.

**Dental Age Estimation, Asylum Seekers, Refugees**

## F45 What's So Special About a Specialist?

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After attending this presentation, attendees will have an understanding of the reason why pursuing recognition of forensic odontology as a "legitimate" specialty by the American Dental Association might not be in the best interest of the field.

The presentation will impact the forensic science community by providing a more complete answer, than a simple "no" to the question occasionally asked of forensic odontologists in court: "Is forensic odontology recognized as a specialty by the American Dental Association?"

Forensic odontology is not recognized as a "legitimate" dental specialty area by the American Dental Association (ADA). Most state dental boards allow dentists to present themselves to the public as specialists in *only* the areas approved by the ADA. Therefore, in most states, dentists are permitted to claim to be specialists in only the fields of endodontics, orthodontics, periodontics, pedodontics, prosthodontics, oral & maxillofacial pathology, oral & maxillofacial radiology, oral & maxillofacial surgery, and dental public health. A dentist wishing to present him/herself as a specialist must, of course, meet the requirements promulgated by the particular dental board in the state where the dentist practices—generally, one of the requirements is certification by the appropriate board of examiners in the specialty area. The ADA has designated the organizations which are these "legitimate" certifying bodies, and also what sort of training is necessary to meet the requirements in order to challenge the respective board exam.

The American Board of Forensic Odontology (ABFO) was established in 1976 under sponsorship of the American Academy of Forensic Sciences (AAFS). In order to practice forensic odontology at a high level of competency—particularly in the area of bite mark analysis—substantial training and experience is required beyond that received in the usual undergraduate dental curriculum. The requirements established by the ABFO for an odontologist to be eligible to challenge the board exam are extensive, and the examination is rigorous. In the span of 33 years since its founding, less than one hundred and fifty individuals have achieved board certification by ABFO.

Nevertheless, the ADA does not recognize specialty certification by ABFO, and does not recognize forensic odontology as a true dental specialty. The primary reasons *appear* to be: (1) forensic dentistry is not considered a "healing art;" and, (2) the educational prerequisites set forth by the ABFO do not include the typical requirement of two-year's full-time study in an ADA-approved academic institution.

Many forensic odontologists, according to anecdotal reports, have been challenged in court by opposing counsel with the question "Is forensic odontology recognized by the ADA as a legitimate specialty?" It is possible the truthful answer "no" might be used by counsel in an attempt to plant a seed in the jury's mind that forensic dentistry is, therefore, somehow untrustworthy. It is contended, though, upon reflection, it is not recognition of forensic odontology by those in the *dental* field that is important, but recognition by those in *forensics* that is significant in court. Forensic odontology may well *not* be a healing art, but it *is* a legitimate and accepted forensic field.

A caution is further presented that *if* forensic odontology *were* recognized by the ADA as a specialty field, there could be a counterproductive result. Dental specialists are usually required by their organizations to restrict their practice to only the specialty area. Since most forensic odontologists are "part-timers" with their principal employment in academics, the military, or in general practice, many would still not be able to limit their practice to only forensics and claim specialty status.

The case of *Potts v. Zettel*, 220 Fed.Appx. 559, 2007 WL 412232 (Ninth Cir. 2007), involved a California dentist (Potts) who advertised to the public that he was a specialist in dental implantology, and that he was board-certified by the appropriate board in that field. But since this is not a recognized specialty area by the ADA, and, consequently, not recognized by the California dental board, California sought an injunction to prohibit Potts from further such advertising. Potts, in turn, sought declaratory and injunctive relief on freedom of speech grounds, and was awarded summary judgment by the federal district court. On appeal, the Ninth Circuit reversed and remanded on other grounds. The impact this case might have on those who wish to present themselves as specialists in forensic odontology is reviewed.

**Specialization, Forensic odontology, Potts vs. Zettel**

## F46 A Preliminary Investigation of Bite Marks on Human Skin: Clothed Versus Unclothed

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After attending this presentation, attendees will understand some principles of bite mark investigation, in relation to force and bruising on a given anatomical location.

This presentation will impact the forensic science community by increasing understanding of the nature of bruising on clothed skin versus unclothed skin.

In bite mark analyses, a forensic odontologist must consider the probability that a bite mark found on the skin surface can be matched to a given pair of teeth. Acceptance of bite mark evidence in court can be traced back to the early nineteen century, although recent knowledge in the field has increased since the late 1970s. This development was substantiated by the number of reported criminal cases which began to accelerate after the conviction of Ted Bundy in 1978. Much attention has been concentrated and focused around the preservation and accuracy in bite mark analyses. The American Board of Forensic Odontology (ABFO) developed a set of guidelines to improve the methodologies used in bite mark cases with one of the most important developments being the ABFO No. 2 reference scale.

This study collected bite mark data and analyzed the differences in bruises between bites on bare skin versus bites through clothing from eight white European adults, in Nova Scotia, of both male and females