

## ASFO 2015 Suggested Research Topics:

- 1) We know that digital scanning works precisely enough to use in the fabrication of dental restorations. To have gotten to that point, research must have been completed. Create a Database/Library of existing literature on this topic to provide easy access to that research in the event any dental forensic scientist should need it for future research. This information can be used in the areas of bitemark analysis, dental age estimation, dental identification, human abuse and neglect, mass victim identification etc.
- 2) Create a dental field guide to the appearance of restorations on radiographs (To be posted on the ASFO and ABFO websites as a resource). The all zirconium BruxZir crowns look just like FGC on radiographs, but are ceramic and not metallic. ZirCAD layered crowns look just like PFMs, but aren't. The eMax crowns look different yet. If you don't use a particular crown, you may not be aware of how it looks on a radiograph.
- 3) Create a Database/Library of the most important Dental Identification research articles that give us the scientific foundation for the content in Dental Identification reports. These articles can then be cited in our Dental Identification reports. This will parallel how dental age estimation reports are currently written.
- 4) Hypothesis: the increasing range of types of restorative dental materials and methods will pose a challenge for accurate dental chart comparison due to radiopacity variation, difficulty in visual recognition and complex restorations using layering methods etc. Put another way, the forensic dentist today and in the future will face challenges in charting younger patients who have been treated using advanced methods. How would this impact forensic dentistry?
  - i) Materials usage: Research could involve surveys of modern private or group practices to take a contemporary snapshot of the variety of restorative materials or methods in use (% amalgam, % resins, layering methods, use of monoblock milled fixed restorations (Cerec etc.).
  - ii) Materials sales: Research could involve a survey of vendor sales indicating what might be the most popular materials selling today. This would work well if there is a good relationship with dental materials vendors who would be willing to supply such info.
  - iii) Materials in patients: Could also involve analysis of individual practices, % of patients with amalgam or resins vs. age of patient. The question to be posed (although unimaginable), if all your patients died today, what kind of dental materials profile would you have recorded? What percentage would have amalgams or the latest resin you may have tried? We had a recent case in which a date of death date range was established based on the brand of restorative materials present. Thus it would be useful to know when new materials and techniques became introduced, and when their use became widespread, and when superseded. Could also involve survey of manufacturer's time lines for products.

- 5) Hypothesis: the move to digital records will or will not assist in victim identification.
  - i) Are there enough fields in the software to add notes such as dental material brand use? Which software packages are most compatible with missing person's databases etc.? Which are most popular today?
  - ii) Can we compare software packages that allow this, and make some kind of recommendation for approval by ASFO/AAFS Odontologists?
- 6) Reliability of Third Molar Development for Age Estimation using the Demirjian (1973) Staging Technique in a United States Asian Population and compare results to existing US population specific studies available using the same technique.
- 7) Compare computer assisted digital measurement methods of root translucency using the Bang/Ramm Technique (1970) for adult dental age estimation to manual calipers/ non-computer assisted measurement techniques. Which generates greater accuracy if any?
- 8) What lighting method and root preparation technique gives the best result to visualize and measure root translucency in those adult dental age estimation techniques that utilize root translucency?
- 9) Update the Demirjian Developmental Stages of the Permanent Dentition Chart (Stages A-H for Molars, Bicuspid, Canines and Incisors) using digital radiographs.
- 10) Update the Demirjian Developmental Stages of the Primary Dentition Chart (Stages A-H for Molars, Canines and Incisors) using digital radiographs.