



## Forensics in Pediatric Dentistry

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### Abstract:

Pediatric dentistry is a dental specialty dealing with treatment in children and young individuals. Forensic dentistry deals with the legal implications of dentistry and scrutinizes dental evidence for justice. Pediatric dental professionals can play an imperative role in the identification process by using age estimation methods, radiographic interpretation of tooth calcification, tooth maturation and eruption sequence, and clinical assessment of the previous restorative, endodontic, or orthodontic therapy and oral and maxillofacial anomalies. They can also assist forensic investigations by recognizing cases of child abuse and dental neglect. This paper aims to highlight important and unexplored features of the forensic part of pediatric dentistry, the explicit role of the pediatric dentist and the research avenues which need to be explored.

**Keywords:** Pediatric dentistry, forensic dentistry, identification, child abuse, dental neglect.

### Introduction:

In the recent past, forensic odontology has made great strides and has evolved as a separate specialty. Forensic dentistry is the branch of dentistry dealing with the accurate handling and examination of dental evidence, correct evaluation, and presentation of dental evidence.[1] It is a legal field of dentistry and scrutinizes dental evidence in the interest of justice.[2]

Pediatric dentistry is a dental specialty dealing with the oral health care of children and younger individuals and provides both primary and comprehensive dental treatment. The scope of pediatric dentistry as a dental specialty is enormous. This specialty is known to deal with other specialties of dentistry on a routine basis. However, it can be utilized for exploring the identification of an individual, identification of child abuse and dental neglect, identification of perpetrators of bite-marks, and age estimation for both the living and the dead individuals. Hence it becomes essential for pediatric dentists not only to safeguard and protect children but also to become aware of the laws governing child protection.[3]

This short communication aims to throw light on the forensic facet of pediatric dentistry, a relatively unexplored aspect. The article strives to be of interest to pediatric dental professionals, forensic odontologists, dental clinicians and pediatricians around the globe.

### Applications of Forensics in Pediatric Dentistry:

1. Identification of child abuse- Pediatric dental professionals plays an imperative role in identifying and recognizing the signs and symptoms of child abuse. Abuse can be physical, emotional, or sexual and can have long-lasting effects on the mind of the child patient. Hence pediatric dentists should examine cases of child abuse proactively.[3]

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2. Reporting of child abuse- After identification of child abuse cases, the pediatric dentist needs to report the cases immediately. Most dental professionals feel hesitant to report cases of child abuse. The cases need to be referred to appropriate child protective agencies for suitable action without any delay. It is an ethical duty of pediatric dental professionals to ensure that all clinicians working on child patients are aware of CHILDLINE i.e. 1098. It is India's national emergency helpline phone service for reporting abuses against children which is toll-free with a 24X7 availability.[3]
3. Identification of dental neglect- Dental neglect can be defined as “Willful failure of parent or guardian to seek and follow through with treatment necessary to ensure a level of oral health essential for adequate function and freedom from pain and infection.”[4]Dental neglect may result from factors like family isolation, financial constraints, or parental ignorance due to lack of knowledge. Pediatric dentists are in a position to easily identify the exact cause during the detailed recording of the case history.
4. Identification of bite-marks- “A bite mark is a patterned injury or surface disturbance produced by teeth on the skin of an individual or inanimate object.” [5,6] A pediatric dentist with formal training in forensic odontology will be able to recognize, identify and manage the case of bite-mark injury in child patients more effectively. [5]
5. Age estimation- Age estimation of the living and the deceased individuals from their teeth and jaws is an important sub-discipline of forensic sciences. Many methods of age estimation have been suggested in the recent past. Some of the important ones are the presence of neonatal line, Schour and Massler's method, Demirjian's method. [7]
6. Identification from traumatic dental injuries- Unexplained traumatic dental injuries like avulsion of teeth, repeated hard tissue injuries like fractured teeth, and associated soft tissue injuries like torn labial or lingual frenum in relation to physical child abuse are easily identified by pediatric dentists during detailed history recording and clinical examination.[8]
7. Detection of Craniofacial anomalies- In most cases, pediatric dentists usually the first dental professional to recognize and identify any oral and maxillofacial anomalies. The anomalies which are unique to an individual can help identify them.
8. Restorative, endodontic, and orthodontic therapy in children- Restorative, endodontic, and orthodontic treatment done in children can assist in the identification procedure. The pediatric dentist can help in identifying the dental and interim restorations as they are specific for children. The endodontic treatment can be easily recognized through previous radiographic records. Any anomalous tooth morphology or variation in developing dentition can act as an aid in identification. Specific orthodontic appliances fabricated in children are also very helpful in identifying individuals.[2]
9. Assessment of tooth calcification, tooth maturation, and eruption sequence- Tooth calcification, maturation, and eruption sequence is unique to an individual's dentition. It can be easily assessed using radiographs. The assessment using different methods i.e. Demirjian, Nolla, Morrees can be a valuable resource for differentiating individuals.[2]
10. Human identification: Identification of humans is of vital importance and a challenge in any forensic investigation. Pediatric dental professionals can help the forensic investigation team immensely through clinical and radiographic assessment and previous dental records.

#### Research Gaps:

Many research avenues need to be explored in forensic odontology from a pediatric point of view. Some of them are as follows:

1. Application in anthropology in pediatric context.[9]
2. Application of DNA-based techniques in pediatric patients.
3. Application of superior techniques in pediatric age-group like ameloglyphics, automated age estimation, block chain enabled digital forensics investigation.
4. Exploring the possibility of 3-D facial reconstruction, scanning and printing concerning children.
5. Application of 3-D photography, computerized and electronic image enhancement equipment for the demonstration of the uniqueness of an individual's bite marks.

#### Conclusion:

This short communication is an attempt to create awareness regarding the forensic component of pediatric dentistry among pediatric dental professionals and forensic odontologists worldwide. Pediatric dentists working on child

patients should be responsible enough to understand the forensic implications associated with the pediatric dental practice. They can act as expert witnesses in forensic investigations concerning children. Pediatric dental professionals need to establish lines of communication and collaborate with the forensic investigation team for a professional and more comprehensive approach.

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