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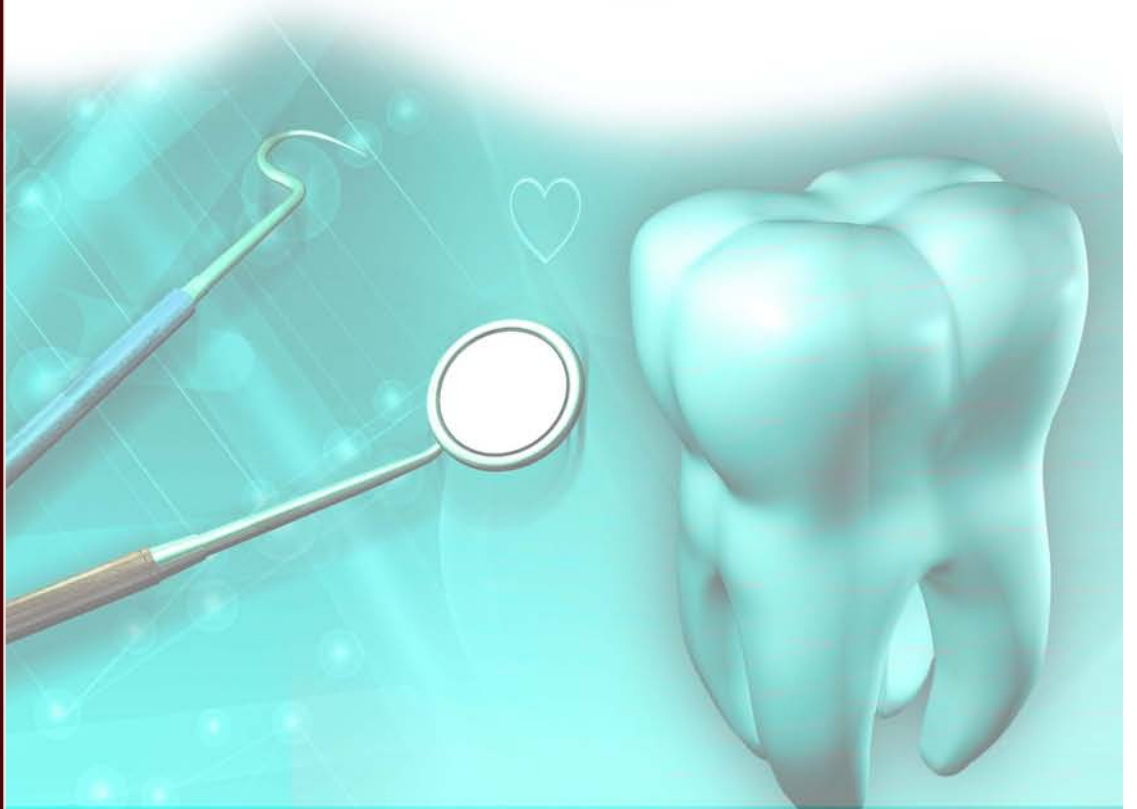


# Journal of Interdisciplinary Dental Sciences

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# Journal of Interdisciplinary Dental Sciences

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*“Mind once stretched cannot regain original dimension again”. The progression of research goes on generation to generation, to thousands of years on this magical planet.*

## Partners for education & excellence

In the field of education and research, India is passing through a transitional zone. Indian Parliament, Govt. of India and State Governments are in the need of starting new educational institutes, universities, colleges which is a need of a largely populated country like India. But at the same time it is true that there is no single university of India enrolled in the list of top universities in the world. The core reason behind this is the lack of research work in educational institutes in India in order to bridge these academic standards. It becomes moral and ethical responsibility of all colleges and university to plan, promote and implement research activities.

As Founder Chairman & Chief Managing Trustee of Saraswati Dhanwantari Dental College & Hospital and Post Graduate Research Institute, Member of Senate-Maharashtra University Health Science, Nashik. It is my pride and privilege that my college is located in developing area which has taken initiative in research activity in the field of dentistry. ‘Well begin is half done’, Journal of Interdisciplinary Dental Sciences of Saraswati Dhanwantari Dental College & Hospital will provide a platform for new aspiring research scholars, students and teachers to publish their research article and to share the knowledge and experience of the research . I congratulate the Dean, the Editorial Board and the associated team for starting this research activity at college level. I wish them all the best for pioneer out comes through their research. I hope research activities and projects focused and targeted on this platform of Journal will reach to State, National, International level of the acceptance. As senior most Senator of Maharashtra University Health Science Nashik, I humbly request all the affiliated colleges to use this platform for research activity to create interactive platform in the State of Maharashtra.

Knowledge has no borders, so I expect all the research oriented students and faculties across the country and abroad to share this research journal platform for internal exchange of the knowledge. I always feel research is a stretch of mind, “Mind once stretched cannot regain original dimension again”. The progression of research goes on generation to generation, to thousands of years on this magical planet.

**Dr. Prafulla Patil**

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## **Editorial**

### **Inaugural Message**



It is my firm belief that no matter how good something is, it can always be made better. While I am sure that our efforts have borne fruit, I feel that there is need to work further towards our mission to excel, a mission which is a journey not a destination. "Success does not come to those who do different things, but do things differently". Success comes to those who make it happen and not let it happen.

In this era of dentistry attaining new heights, where dental science has gained outstanding importance from concept, technology and materialistic perspectives, with the increasing awareness among masses about dentistry; it becomes really important as well as mandatory for all dental practitioners as well as students to constantly keep updating their knowledge and skills about the latest technology, equipment and trends in dentistry; which is the sole aim of this journal. I have prioritized some of my work that are very dear to my heart and have bearing on the future of dentistry. Once again I appeal you all to make it better with submission of high quality research work.

I thank from bottom of my heart, our Chief Patron Hon. Dr. Prafulla Patil, Hon. Founder President & Chief Managing Trustee, Member of Senate-MUHS, Nashik and Dr. Mrs. Vidhya Patil, Secretary, SD Dental College & Hospital, Parbhani for shouldering such a huge responsibility. I also thank our advisory, editorial, reviewers board for cooperating to comeout with this inaugural issue in successful manner.

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# Centuries of Conservative Dentistry

*Dr. V. Santi, MDS\*, Dr. Vummidisetti V. Subbarao, MDS\*\**

## Abstract:

It is over 100 years since G V Black gathered together most of the knowledge on the caries process and set clear parameters for the discipline of operative dentistry. However, over the last 50 years there has been great progress in scientific method and in knowledge of the common diseases of the oral environment, including the caries process. Improvements in the scientific method have led to a better understanding of the oral environment, resulting in extensive changes for this profession. It is suggested that the standards set by Black should be now consigned to history. The contributions of many practitioners, educators, and researchers throughout the world have resulted in operative dentistry being recognized today as a scientifically based discipline that plays an important role in enhancing dental health. No longer is operative dentistry considered only the treatment of "cavities" with "fillings." Modern operative dentistry includes the diagnosis and the treatment of many problems, not just caries. The profession should be prepared to move on with the knowledge of past.

**Keywords:** conservative dentistry, dental history

## Introduction:

Dentistry originated in the seventeenth century in England by "barber-dentists". The practice of these early dentists consisted mainly of tooth extractions. Many practiced dentistry while pursuing other livelihoods and some traveled from one area to another to provide their dental services. Much of the knowledge and many of the techniques for the first successful tooth restorations were developed, however, much of the practice of dentistry during the founding years was not based on the scientific knowledge, and disputes often arose regarding treatment techniques and materials. It is over 100 years since G V Black gathered together most of the knowledge on the caries process and set clear parameters for the discipline of the operative dentistry. Scientific foundation for the operative dentistry was further expanded by Black's son, Arthur.<sup>1</sup> In addition to the Blacks, others such as Charles E. Woodbury, E.K. Wedelstaedt, Waldon Ferrier, and George Hollenback made significant contributions to the early development of operative dentistry.<sup>1-3</sup> The contributions of many practitioners, educators, and researchers throughout the world have resulted in operative dentistry being recognized today as a scientifically based discipline that plays an important role in enhancing dental health.

The problems of dental caries and periodontal disease go far back into history but Black entered the profession at a time when these diseases were endemic in the European and related communities. There had been very little by way of scientific literature published over the recent centuries but there was some discussion taking place on the causes, and therefore cures, available. Caries was regarded as "gangrene" of the tooth structure and it was not clear as to whether it began on the outside or the inside of the tooth crown.<sup>1-3</sup> The roles of bacteria and food stuffs were debated and the materials for restoration of lesions were relatively primitive. However, over the last 50 years there has been great progress in scientific method and in the knowledge of the common diseases of the oral environment, including the caries process, so maybe it is time for change.

It was just 40 years since Tomes<sup>1</sup> using the very earliest version of a microscope, defined the histology of tooth structure and even less time since WD Miller,<sup>2</sup> working with Koch, first identified lactobacillus as an organism responsible for the generation of acid in the oral environment. Black settled a vigorous argument of the day by stating clearly that caries always begins on the outside of the tooth never from within. He noted that "it consists of dissolution of calcium salts by lactic acid followed by decomposition of the gelatinous body

of the organic matrix". He went on to reprimand the profession stating clearly that "the complete divorcement of dental practice from studies of the pathology of dental caries, which has existed in the past, is an anomaly in science that should not continue".<sup>3</sup> Within his textbook Black set the scene for a level of understanding that had been previously unknown to this profession. Drawing on the knowledge of the time he identified the primary causes of the disease of caries and he charted its progress through both enamel and dentin. Microscopy, microbiology and chemistry were in their infancy and Black used them to their full extent to demonstrate that bacteria were related to both caries and disease of the gums and surrounding soft tissue. Black developed a classification of caries lesions, with the numerical sequence dependent upon the frequency with which the lesions occur. Thus the Class I lesion represented the occlusal fissure, the most common site, and the Class V was the cervical lesion, the least common, and this classification is still in general use. He rationalized the production and clinical application of amalgam for the restoration of lesions and set standards for dental cements. By the middle of the 1950s operative dentistry was the primary discipline of the profession and the literature of the time demonstrates the deep interest that had been generated.

From the 1940s to the 1970s there was considerable research carried out into restorative dental materials including clinical handling of amalgam,<sup>4,5</sup> perfection of casting techniques for gold alloys,<sup>6</sup> increased fracture resistance in dental ceramics<sup>7</sup> and improvements in impression materials.<sup>8</sup> Parallel with these developments came the introduction of high speed and ultra high speed rotary cutting instruments<sup>9,10</sup> as well as more effective local anaesthetics.<sup>11</sup> In 1955, Buonocore<sup>12</sup> showed that it was possible to gain mechanical adhesion between enamel and a polymethyl-methacrylate resin restorative material, thus overcoming microleakage which had always appeared to be one of the main problems of

restorative dental materials. By the mid 1960s this had become a resin composite restorative material and there was considerable optimism that it would become the universal restorative material. Ten years later, in the 1970s, there was a further adhesive material, the glass-ionomers, introduced to the profession.<sup>13,14</sup> They are also reasonably aesthetic and have been shown to adhere to both dentine and enamel through an ion exchange mechanism. They are waterbased and also bioactive in as much as they release calcium or strontium ions, as well as phosphate and fluoride ions, into surrounding tooth structure and these can assist in remineralization of a caries lesion.<sup>15</sup>

The changing trends in restorative materials were thoughtfully reviewed by Phillips<sup>16</sup> in 1989 and it became apparent that there had been a revolution in the treatment and understanding of the caries lesion over the last three decades. Both the profession and the public appreciated these improvements. However, even now some of Black's teaching prevails, particularly in relation to cavity design. The Black cavity was designed for restoration with amalgam or cast gold and was based upon "extension for prevention" in the presence of continuing disease. As early as 1967 Massler<sup>17</sup> drew attention to the changing concepts in the treatment of caries. Work by Kidd and Fejerskov,<sup>18</sup> Featherstone,<sup>19</sup> TenCate<sup>20</sup> and many others, from the early 1970s onwards, helped to elucidate this. By 1980 Fusayama and his team was prepared to summarize their concepts on major modifications to cavity designs and the use of a total etch technique using resin composite as the restorative material.<sup>21</sup> The significance of in vivo observation and research cannot be overemphasized and the profession has a serious responsibility to insist on improved longevity with all restorative materials. As suggested by Black, operative dentistry must begin with cariology and it is essential that it becomes again the dominant discipline in this profession. With elimination of the disease and the consequent reduction in the damage caused by the disease there will be a commensurate reduction in the surrounding



disciplines and our patients will be healthier and happier. The entire practicing profession will need to be involved in the introduction of these changes in philosophy.

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# Centuries of Orthodontics

*Dr. Ravindra Reddy Regella, MDS\*, Dr. Aweg Saxena, MDS\*\**

## Abstract:

History of orthodontics can be traced back as long as 3000 B.C ago, even the Egyptian were concerned about the esthetic face and straight teeth. If you think the desire for straight teeth is a trapping of modern society, think again! Extreme Makeovers may be new, but “braces” date as far back as ancient man!

Orthodontics finds itself directly involved in the new social outlook that has converted health from a privilege of the few to an entitlement for all. For years orthodontists have attempted to upgrade scientific and professional expertise. Now they are plagued with constraints from sources outside the specialty; continuing economic problems, threats from a variety of agencies to develop new plans for orthodontic care delivery systems, and governmental restraints have become part of our way of life.

Orthodontics has achieved the status of a recognized specialty of dentistry because of a long period of craftsmanship and professional expertise. Our objective has always been to provide for the preservation of dental health through the conservation of oral structures and the maintenance of dental function. Orthodontics, and indeed all of dentistry if it is to survive as a profession, must continually reexamine its history and find relevant and significant ideals to meet the crises of today.

**Keywords :** History, Orthodontics, Dentofacial Orthopedics

Dentistry, and indeed orthodontics, does not work in isolation but in scientific harmony with all health disciplines. There is an increased participation in the basic sciences—biology, medicine, and technology. The areas of abnormal orofacial growth and development and birth defects are receiving increased attention. These are few examples for pathways to progress towards modern orthodontics.

Even ancient people wanted straight teeth! According to the AAO (American Association of Orthodontists), archaeologists have discovered mummified ancients with crude metal bands wrapped around individual teeth. To close gaps, it has been surmised that catgut did the work now which is done by today’s orthodontic wire! Later, in 400-500 BC, Hippocrates and Aristotle both ruminated about ways to straighten teeth and fix various dental conditions. Straight teeth have been on our minds a very long time!

History of orthodontics can be traced back as long as 3000 B.C ago, even the Egyptian were concerned about the esthetic face and straight teeth, as some mummies were found to be using metal bands wrapped around teeth with catgut<sup>1-3</sup>. Until

Pierre fauchard the orthodontics was not in lime light (1678-1793), hence rightly called as “father of modern dentistry and orthodontia” he developed the bandeau or bandolet in 1723.<sup>2,4-6</sup> The first modern orthodontic appliance, This is the first expansion appliance, consisting of a heavy maxillary labial arch of precious metal to which teeth were ligated, and was the basis of Angles future study on expansion arch. The centre of orthodontics growth was in Europe till 18<sup>th</sup> and early 19<sup>th</sup> century<sup>2,5,6</sup>.

When the new world was discovered by Columbus, the European tooth operator were brought their skills to Colonial America, and by 19<sup>th</sup> century the United States held the dominant position in dentistry, and specifically orthodontics.<sup>2,6</sup> The late 19<sup>th</sup> century was marked by significant developments by American pioneers in orthodontics. Norman W. Kingsley introduced occipital traction to move anterior teeth back into extraction spaces in 1879, used a vulcanite inclined plane and artificial vellum of soft rubber for cleft palate treatment in 1859.<sup>6,7</sup> In 1860, Emerson C. Angell was likely the first to expand the midpalatal suture with a split plate.<sup>6,7</sup>

John Nutting is known as the “Father of American Orthodontics” he was among the first to

retract anterior teeth using occipital anchor age. Moving into the end of the 19th and beginning of the 20th century, orthodontics in America advanced considerably as the "Age of Systems" began. Calvin S. Case contributed greatly to the orthodontic literature, along with Henry Baker and wanted to change the specialty's name to "facial orthopedia." In 1887, Victor H. Jackson developed the "Jackson System", consisting of a wire crib with soldered finger springs for tooth movement. William E. Walker used the Jackson appliance with precious metals, and then George B. Crozat modified the Walker appliance in 1919, and he originally called the Crozat appliance the "invisible brace" which was removable<sup>4,10</sup>

Edward H. Angle (1855-1930), work by this time, and by 1900 he had developed the E(expansion)-arch. was comprised of ligatures from a heavy (0.036" – 0.060" gold) labial arch that brought misaligned teeth to the line of occlusion. Angle developed the pin-and- tube appliance in 1910. Angle introduced the Ribbon Arch in 1916. Modern appliances are based on Angle's edgewise concept, only with several modifications and variations.<sup>4,9-12,14,15</sup> Spencer R. Atkinson invented the Universal appliance in 1929, which was introduced in 1937 as a combination of the ribbon-arch and edgewise appliances, and followed Oppenheim's theory of using light forces. Unitek Corporation, made the first brackets for the Universal Technique.<sup>16-19</sup> Stainless steel was widely adopted by American orthodontists in the 1930s, and soon became the most common material used in construction of appliances.<sup>10</sup> Joseph E. Johnson (1888-1969) introduced the Twin-wire appliance in 1932.<sup>4,12,19</sup>

In 1933, P. Raymond Begg developed his own bracket consists of a narrow ribbon-arch bracket turned upside down, The Begg technique was useful for extraction treatment, and Begg introduced auxiliary springs to control root positions in the 1960s and the multi loop light-wire Begg technique in 1965. Peter C. Kesling developed the Tip-Edge bracket (trademarked by TP Orthodontics, in 1986. ).<sup>9</sup>

The most revolutionary advancement in orthodontics within the past 50 years has been done by Lawrence F. Andrews' through the development of the Straight-Wire Appliance in 1970. Andrews described the "Six Keys to Normal Occlusion." He designed individual brackets for each tooth type to work without wire bending, because he found that when in optimal occlusion, there exists extensive similarities in morphology and position of normal tooth types.<sup>12</sup> Numerous additional prescriptions have been developed by others, including Roth, Ricketts, Alexander, Hilgers, Burstone, Tweed, Cetlin, Bench, Creek-More, Hasund, and McLaughlin/Bennett/Trevisi.<sup>12</sup> Orthodontic appliance technology continues to develop. Self-ligating brackets, computerized bracket placement, computer designed removable aligners, bite-jumping appliances, distalizing appliances, and implant anchorage are currently making history. However, without a good diagnosis and treatment plan, and careful management of the treatment process, improved appliances cannot bring us closer to ideal treatment goals.

#### **The Future: Technology Continues to Advance**

As technology enhances our daily lives, it also continues to advance the science of orthodontics. More and more companies are utilizing digital computer imaging to make orthodontic treatment more precise. The Sure Smile system by OraMetrix, for example, takes a detailed 3-D model of a patient's teeth and helps the orthodontist develop a precise treatment plan for tooth movement. The orthodontist's treatment plan then drives a highly accurate robotic process to customize the arch wires needed for treatment. This often shortens treatment time and gives highly accurate results. NASA developed one of the late 20th century's most dramatic orthodontic breakthroughs: heat-activated nickel-titanium alloy wires. At room temperature, heat-activated nickel titanium arch wires are very flexible. As they warm to body temperature they become active and gradually move the teeth in the anticipated direction. Because of their high-tech properties, these wires retain their

tooth-moving abilities longer than ordinary metal wires and need less frequent attention from the orthodontist. Many orthodontists now employ heat activated wires in their treatment plans.

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# Centuries of Pedodontics

*Dr. George Kurian Panampally, MDS\*, Dr. Rehan Khan, MDS\*\*, Dr. Anil Kumar Patil, MDS\*\*\**

## Abstract :

Pedodontics has come a long way from its early days of extraction oriented beginning to the current comprehensive era with the emphasis on diagnosis and treatment planning. As the year passed by, time changed and so did the schedule for initial appointment for the child. This specialty is now recognized by the American Dental Association, Royal College of Dentists of Canada, and Royal Australian College of Dental Surgeons. It is mandatory to have thorough knowledge of evolution of pediatric dentistry and also the recent advancements of it. In India, the foundation of Pedodontics was laid down in Government Dental College, Amritsar. Dr. B.R. Vacher was considered as the Father of Pedodontics in India due to his immense contribution towards the specialty. This paper reviews the evolution and progress made by pediatric dentistry over the centuries. Thus it helps in increasing awareness regarding primary dentition and its role for better child oral health.

**Key words:** Pedodontics, History, Pediatric Dentistry.

## INTRODUCTION

Child is the nature's most benevolent creation. Child undergoes dynamic changes like mental, physical, and emotional. Pedodontics is the branch of dentistry concerned with providing comprehensive and interceptive oral health, making it the most satisfying and rewarding specialty of dentistry. In this the word Pedodontics is derived from Greek word. It is made up of two words Pedo + Dontics. Pedo is derived from "Pais" which in Greek means child while "Dontics" stands for study of the tooth.<sup>1</sup>

Pedodontics has come a long way from its early days of extraction oriented beginning to the current comprehensive era with the emphasis on diagnosis and treatment planning. There was a time when dental clinics were biased against this specialty and considered it a waste of time and very often clinics displayed "No Treatment For Children Under The Age Of 14 at This Clinic". Most of the dentists also gave a negative knowledge influence to the parents and the most common excuse that was offered was, "these are milk teeth and fall on their own so treating them would be a waste of time and money".<sup>2</sup>

As the years passed by, times changed and so did the schedule for initial appointment for the child. It has become increasingly difficult to define exact boundaries and limitations of pedodontics due

to continuous developments and advancements.<sup>1,3</sup> Therefore it is mandatory to have thorough knowledge of evolution of pediatric dentistry and also the recent advancements of it.

## DEFINITIONS OF PEDODONTICS

**Stewart, Barber, Troutman, Wei (1982)<sup>4</sup>:** "Pediatric dentistry is the practice and teaching of comprehensive preventive and therapeutic oral health care of child from birth through adolescence. It is construed to include care for special patients who demonstrate mental, physical or emotional problems."

**American Academy of Pediatric Dentistry (1985)<sup>1</sup>:** Pediatric dentistry also known as Pedodontics and as dentistry for adolescents and children, is the area of dentistry concerned with preventive and therapeutic oral health care for children from birth through adolescence. It also includes special care for special patients beyond the age of adolescence who demonstrate mental, physical or emotional problems."

**Boucher's Dental terminology's (1993)<sup>1</sup>:** "Pedodontics is the branch of dentistry, that includes having a child to accept dentistry, prevention, detection, restoration of primary and permanent dentition; applying preventive measures for periodontal therapy; dental caries prevalence, intercepting and correcting various areas of malocclusion."



**American Academy of Pediatric Dentistry (1999)<sup>5</sup>:** “Pediatric dentistry is an age-defined specialty that provides both primary and comprehensive preventive and therapeutic oral health care for infants and children through adolescence, including those with special health care needs.”

#### **WORLD-WIDE HISTORY OF PEDODONTICS**

Hippocrates in the 5th Century B.C. mentioned about the differences between the child and the adult patient. In the 4th Century AD, Celsius recognized that the child must be treated differently from adults. The discovery of childhood began around the 13th century. (By the Middle Ages, children started getting more attention especially as the heirs and sons of the ruling houses and had belief not die while teething”).<sup>1</sup>

1800 BC- In Ancient Egypt no caries was found in children’s teeth. Since then lot of attention has been paid to oral health of children.<sup>9</sup>

1563-64- Eustachius described and showed illustrations of both primary and permanent dentition.

1737- Gerauldy discussed about theories regarding tooth eruption and exfoliation.

1763- Joseph Hurlock published first book on children’s dentistry.

1764- Robert Bunon Father of Pedodontics” reiterated the importance of deciduous dentition.

1926 – Dr. Samuel D. Harris – “Father of Children’s Dentistry Organizations world-wide, started the Detroit Pedodontics Study Club<sup>10</sup>

1927- Detroit Study Club is now named the American Academy for Promotion of Dentistry for Children (AAPDC).<sup>10</sup>

1940- American Academy for Promotion of Dentistry for Children renamed as the American Society of Dentistry for Children (ASDC).

1947- American Academy of Pedodontics was founded (AAP).

1967- International Symposium on Child Dental Health (CDH) was conducted at London Hospital Medical College.

1969- International Association of Dentistry for Children was established. (IADC).<sup>3</sup>

1984- American Academy of Pedodontics it renamed to the American Academy of Pediatric Dentistry (AAPD).The American Academy of Pediatric Dentistry (AAPD), founded in 1947, is the membership organization representing the specialty of pediatric dentistry. The membership provides care to millions of our nation’s infants, children, adolescents, and persons with special health care needs. They are the primary contributors to professional education programs and publications on pediatric oral health.<sup>11</sup> This specialty is now recognized by the American Dental Association<sup>6</sup>, Royal College of Dentists of Canada<sup>7</sup>, and Royal Australian College of Dental Surgeons<sup>8</sup>. According to AAPD it is important to establish a comprehensive and accessible ongoing relationship between the dentist and patient – referring to this as the patient’s “Dental Home”.<sup>12</sup>

#### **Pediatric Dentistry in India**

In India the first Dental College, “Calcutta Dental College and Hospital” was started in the year 1920 by Dr. Rafiuddin Ahmed in his private chamber. Dr Ahmed, the Father of Dentistry in India is also known as “The Grand Old Man of Dentistry”.He is credited with the first edition of “The Indian Dental Journal” in October 1925, foundation of the “All India Dental Association” in the year 1927, drafting and passing of the Bengal Dentist Act in 1939, and the passing of the Dentist Act in 1948.

Dentistry as a subject was introduced as a 2 years diploma course to “Licentiate in Dental Science (LDSc)”. It was changed to the 3yr. course in the year 1926 and further modified to the present 4yr. B.D.S. course in 1935.The foundation of Pedodontics was laid down in Government Dental College. Amritsar in 1950.Pedodontics did not exist as an independent specialty in the initial years of development of Dentistry in India, but was included as mere one or two questions in the Operative Dentistry paper.

Later it was recognized as the section – B of the question paper of Orthodontics. In the year 1988 as per D.C. rules it got its due importance and was treated as a separate entity. Following Amritsar the next to introduce this specialty were K.G.M.C. Lucknow (1967), P.G.I. Chandigarh (1978) and GDC

Bombay (1982). The fifth in succession and first in south India was the C.O.D. S. Manipal in the year 1985 under Dr. Shobha Tandon.

The Association of Indian Pedodontists held its first conference on the 24th of November 1979 where it was first named as the Indian Society of Pedodontia (now Pedodontics) and Preventive Dentistry. Its constitution was drafted by Dr. Mrs. Amrit Tewari. Contributions made by Dr. B.R. Vacher, the Father of Pedodontics in India were recalled and thus he was unanimously made the life patron of the society. M.L. Gauba was elected first president of the society; Dr. Mrs. A. Tewari the first General Secretary and Dr. H.S. Chawla was the first editor of the journal. In 1982 Indian Society of Pedodontics and Preventive Dentistry became an affiliate member of the International Academy for Dentistry for Children.<sup>1</sup>

#### Conclusion:

It has become increasingly difficult to define exact boundaries and limitations of pedodontics due to continuous developments and advancements. Many people contributed in the emergence of Pedodontics as a specialty world wide as well as in India. Therefore it is mandatory to have thorough knowledge of evolution of pediatric dentistry and also the recent advancements of it. This paper aims at providing the information regarding the evolution and progress made by pediatric dentistry over the centuries. Thus, it helps in increasing awareness regarding the primary dentition and its role for better child oral health.

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**ANNEXURE-2****EXAMPLES OF REFERENCES - VANCOUVER STYLE**

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Vega KJ, Pina I, Krevsky B. Heart transplantation is associated with an increased risk for pancreatobiliary disease. *Ann Intern Med* 1996;124: 980-3.

More than six authors:

Parkin DM, Clayton D, Black RJ, Masuyer E, Friedl HP, Ivanov E, et al. Childhood leukaemia in Europe after Chernobyl: 5 year follow-up. *Br J Cancer* 1996;73:1006-12.

**2. Organization as author**

The Cardiac Society of Australia and New Zealand. Clinical exercise stress testing. Safety and performance guidelines. *Med J Aust* 1996; 164: 282-4.

**3. No author given**

Cancer in South Africa [editorial]. *S Afr Med J* 1994;84:15.

**4. Article not in English**

(Note: NLM translates the title to English, encloses the translation in square brackets, and adds an abbreviated language designator.) Ryder TE, Haukeland EA, Solhaug JH. Bilateral infrapatellar seneruptur hostidligere frisk kvinne. *Tidsskr Nor Laegeforen* 1996;116:41-2.

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Fisher GA, Sikic BI. Drug resistance in clinical oncology and hematology. Introduction. *Hematol Oncol Clin North Am* 1995 Apr;9(2):xi-xii.



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 Clement J, De Bock R. Hematological complications of hantavirus nephro-pathy (HVN) [abstract]. *Kidney Int* 1992;42:1285.

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Garey CE, Schwarzman AL, Rise ML, Seyfried TN. Ceruloplasmin gene defect associated with epilepsy in EL mice [retraction of Garey CE, Schwarzman AL, Rise ML, Seyfried TN. In: *Nat Genet* 1994;6:426-31]. *Nat Genet* 1995;11:104.

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**16. Personal author(s)**

Ringsven MK, Bond D. Gerontology and leadership skills for nurses. 2nd ed. Albany (NY): Delmar Publishers; 1996.

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Norman IJ, Redfern SJ, editors. Mental health care for elderly people. New York: Churchill Livingstone; 1996.

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Institute of Medicine (US). Looking at the future of the Medicaid program. Washington: The Institute; 1992.

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Kimura J, Shibasaki H, editors. Recent advances in clinical neuro-physiology. Proceedings of the 10th International Congress of EMG and Clinical Neurophysiology; 1995 Oct 15-19; Kyoto, Japan. Amsterdam: Elsevier; 1996.

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Bengtsson S, Solheim BG. Enforcement of data protection, privacy and security in medical informatics. In: Lun KC, Degoulet P, Piemme TE, Rienhoff O, editors. MEDINFO 92. Proceedings of the 7th World Congress on Medical Informatics; 1992 Sep 6-10; Geneva, Switzerland. Amsterdam: North-Holland; 1992. p. 1561-5.

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Issued by funding/sponsoring agency: Smith P, Golladay K. Payment for durable medical equipment billed during skilled nursing facility stays. Final report. Dallas (TX): Dept. of Health and Human Services (US), Office of Evaluation and Inspections; 1994 Oct. Report No.: HHSIGOEI69200860. Issued by performing agency: Field MJ, Tranquada RE, Feasley JC, editors. Health services research: work force and educational issues. Washington: National Academy Press; 1995. Contract No.: AHCP282942008. Sponsored by the Agency for Health Care Policy and Research.

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Kaplan SJ. Post-hospital home health care: the elderly's access and utilization [dissertation]. St. Louis (MO): Washington Univ.; 1995.

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### **25. Newspaper article**

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### **26. Audiovisual material**

HIV+/AIDS: the facts and the future [videocassette]. St. Louis (MO): Mosby-Year Book; 1995.

### **27. Legal material**

Public law: Preventive Health Amendments of 1993, Pub. L. No. 103-183, 107 Stat. 2226 (Dec. 14, 1993). Unenacted bill: Medical Records Confidentiality Act of 1995, S. 1360, 104th Cong 1st Sess. (1995).

### **Code of Federal Regulations:**

Informed Consent, 42 C.F.R. Sect. 441.257 (1995).  
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### **28. Map**

North Carolina. Tuberculosis rates per 100,000 population, 1990 [demo-graphic map]. Raleigh: North Carolina Dept. of Environment, Health, and Natural Resources, Div. of Epidemiology; 1991.

### **29. Book of the Bible**

The Holy Bible. King James version. Grand Rapids (MI): Zondervan Publishing House; 1995. Ruth 3:1-18.

### **30. Dictionary and similar references**

Stedman's medical dictionary. 26th ed. Baltimore: Williams & Wilkins; 1995. Apraxia; p. 119-20.

### **31. Classical material**

The Winter's Tale: act 5, scene 1, lines 13-16. The complete works of William Shakespeare. London: Rex; 1973. Unpublished Material

### **32. In press**

(Note: NLM prefers "forthcoming" because not all items will be printed.) Leshner AI. Molecular mechanisms of cocaine addiction. N Engl J Med. In press 1996.

### **Electronic Material**

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Morse SS. Factors in the emergence of infectious diseases. Emerg Infect Dis [serial online] 1995 Jan-Mar [cited 1996 Jun 5];1(1):[24 screens]. Available





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