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DENTISTRY for the **CHILD** and **ADOLESCENT**

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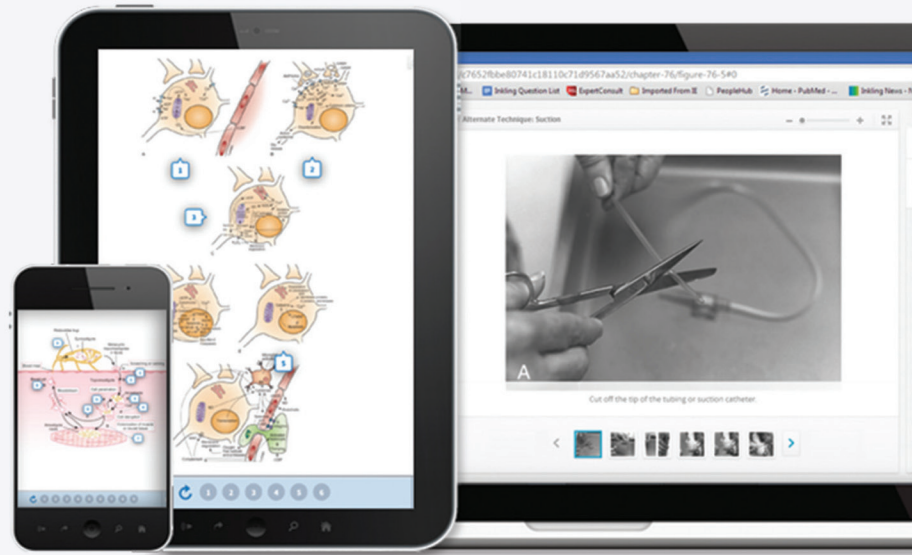
JEFFREY A. DEAN

ASSOCIATE EDITORS: Jones, Sanders, Vinson and Yepes



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McDonald and Avery's

DENTISTRY

for the **CHILD**
and **ADOLESCENT**

ELEVENTH EDITION

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The associate editors of this edition, Jim Jones, Brian Sanders, LaQuia Vinson, Juan Yepes, and I would all like to affectionately dedicate this edition's labor of love to our spouses and children, and our many colleagues and students, both former and current. To our families, we all know the time away from you to work on this project can never be gained back, but your patience, love, and support throughout its production are so wonderfully appreciated by us all.

"May the hinges of friendship never rust, nor the wings of love lose a feather."

EDWARD B. RAMSAY, CIRCA 1857

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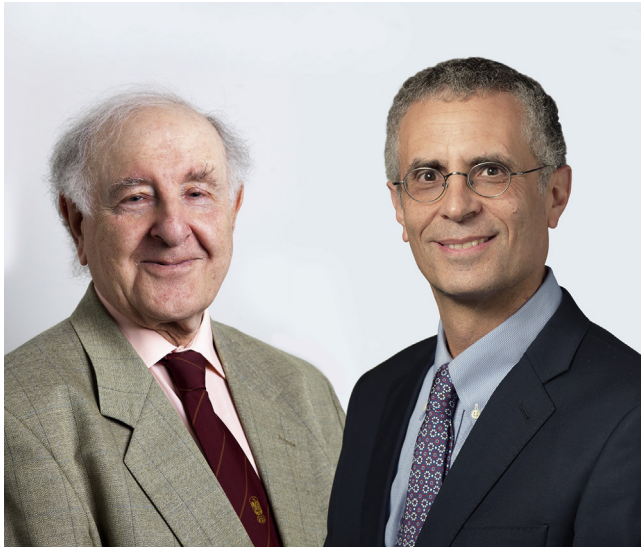
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Foreword to the 11th edition of *McDonald and Avery's Dentistry for the Child and Adolescent: a historical review*



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Introduction

In 1963, when Ralph McDonald wrote *Pedodontics*, dentistry for children was still in its infancy. McBride in 1952 wrote that children were sometimes described as being “temperamental and hysterical, notional and incorrigible.” Many practitioners saw them as small adults and offered little treatment. Nevertheless, there had been for a long time some enthusiastic dentists. One name to remember is Sam Harris, who qualified from Ann Arbor Dental School in 1924. Almost immediately, he enrolled at Boston’s Forsyth Dental Infirmary for Children. He and his fellow students learned much about child dental care at a time

when many American dentists had notices in their offices that no children under the age of 12 years were accepted. Harris opened a practice specializing in pediatric dentistry in Detroit and decided a formal organization was needed to spread good care. In 1927, he and others founded the American Society for the Promotion of Children’s Dentistry, which became the American Society of Dentistry for Children (ASDC) in 1940. In 1947, he was also influential in establishment of the American Academy of Pedodontics, renamed the American Academy of Pediatric Dentistry (AAPD) in 1984. In 1943, Harris was the founding editor of the *Review of Dentistry for Children*, precursor of the *Journal of Dentistry for Children*. In the 1930s, Harris began to formulate ideas on an international organization to bring together children’s dentists from around the world. It was 1969 before his dream was fulfilled with establishment of the International Association of Dentistry for Children, which became the International Association of Paediatric Dentistry in 1991. This all began to put children’s dentistry on a sounder footing, both at the general practitioner and specialist levels.

Walter E. McBride was the first president of ASDC. He and Harris devoted many hours to setting up the new organization. He was also a president of the American Academy of Pedodontics, the American Association of Dental Editors, and the Detroit District Dental Society. McBride was professor of pedodontics at the University of Detroit, so anything he wrote or said was listened to. In 1933, he told a meeting of the American Dental Association that when a general practice dentist refuses to treat children, he is disregarding a major factor in practice building. He quoted a new graduate who opened an office in a town of 2000 inhabitants where two dentists had practiced successfully for many years. They didn’t like the idea of a newcomer with the audacity of a beginner, who installed beautiful new equipment and even employed an office assistant, potentially taking from their income. As he especially liked children, he suggested that they, not enjoying children’s work, should refer them to him, and they agreed. The children came, liked the new dentist, gave favorable reports to their parents and their mothers came for treatment: a practice builder.

McBride published his *Juvenile Dentistry* in 1932, which probably remained the leading text until McDonald entered the field, although there were others. McBride said of his own book, “It was not scientific nor theoretical, but purely a résumé of practical procedures employed over ten years in a private practice devoted entirely to children.” It is not surprising that McBride’s book was highly popular, but by

the end of the 1950s there was room for something new: a text based on scientific methodology.

We have to remember that when McDonald began his career in the 1940s, children suffered from massive dental caries, the prevalence being five times more than current (Bernabé & Sheiham, 2014). Prevention was needed. Following pressure from H. Trendley Dean, in 1945, Grand Rapids became the first city in the world to fluoridate its drinking water. Over 15 years, Dean researched decay in 30,000 schoolchildren and found that caries in children born after fluoridation was reduced by over 60 percent, revolutionizing dental care. For the first time, tooth decay became a preventable disease! Widespread use of fluoride toothpastes came way after McDonald's first book.

Ralph E. McDonald (1920-2015) commenced his career in 1944 with a DDS from Indiana University School of Dentistry. During his service as a naval dental officer, he observed much dental disease amongst young recruits and realized the need for good dentistry already in childhood. McDonald read every textbook and journal about children's dentistry that he could get his hands on. He continued to study once he returned home. Since a degree in pediatric dentistry had not yet been established, he earned a master's degree in microbiology. The year 1946 saw McDonald become an instructor in Indiana University's Children's Dental Clinic, where he pioneered the pediatric dentistry program (Fig. 1). Although he didn't realize it, whilst writing his lecture notes, they were a textbook waiting to happen. In 1952, McDonald became chair of the Children's Dentistry Department. During this period of time, much of the dental treatment for children was given by general practitioners, but some dentists trained as specialist pediatric dentists ("pedodontists" when the book was first published). It goes without saying that both groups needed good textbooks.

In 1963, McDonald published his book, *Pedodontics*, a 479-page compilation of material drawn from McDonald's lectures (Fig. 2). It contained eleven chapters and was highly successful as a textbook for graduate students. Interesting to note is the terminology used for Chapter 2, "Behavior guidance in the dental office." The AAPD only

recently changed its policy and guidelines from behavior management to behavior guidance as was proposed by McDonald over 50 years ago. *Pedodontics* was upgraded in 1969 as *Dentistry for the Child and Adolescent*, which contained his original 11 chapters from 1963 plus an additional 17 chapters written by 14 contributors. From the beginning, the editors and contributors of McDonald's *Dentistry for the Child and Adolescent* have been amongst the specialty's pioneers and top academicians, clinicians, and scientists. Early contributors included Maynard Hine, William Shafer, Ralph Phillips, Roland Dykema, James Roche, and Paul Starkey. Many of them had their own names on the cover of dental textbooks. The list of contributors was and remains tremendous, including esteemed colleagues such as Gerald Wright, Howard Needleman, and George Stookey. Amongst contemporary contributing pediatric dentist authors are John Aps, Ron Bell, Angus Cameron, Judith Chin, Kevin Donly, Burton Edelstein, Hala Henderson, Donald Huebener, Christopher Hughes, James Jones, Joan Kowolik, George Krull, Jasper Lewis, Brian Sanders, Jenny Stigers, Erwin Turner, John Walsh, James Weddell, LaQuia Vinson, and Juan Yepes.

Almost until he died, McDonald remained its author. However, in 1969, McDonald became dean of dentistry. This placed an added burden on his shoulders. And so, after completing the second edition in 1974, McDonald saw the need for a co-editor. He said: "I was getting further and further away from clinical dentistry. After producing two editions, I realized there were areas I could no longer cover by myself. I brought Dave in for his clinical expertise and research experience in dental materials." For the third



Fig. 1 Dr. McDonald (right foreground) with patients and students in the school's pedodontic clinic in 1952.

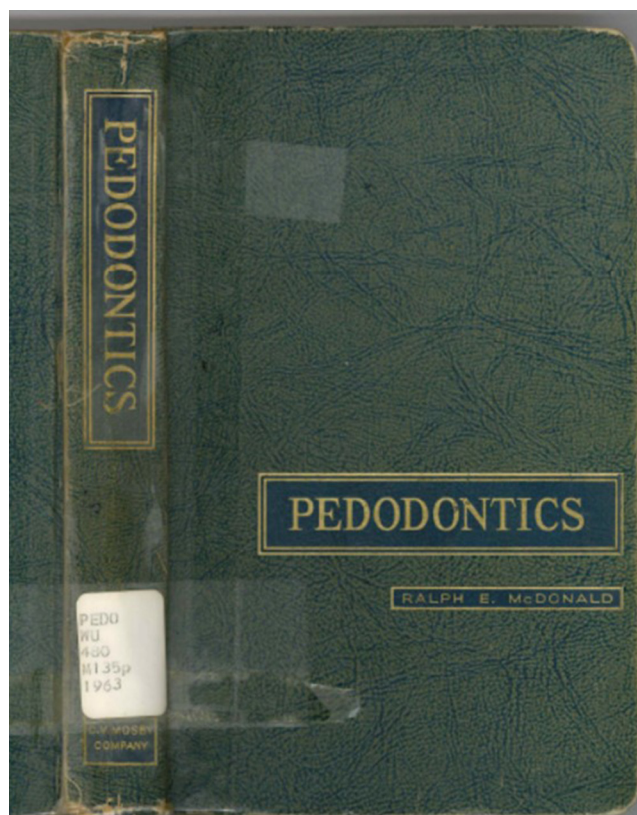


Fig. 2 Cover of *Pedodontics* published in 1963.

edition in 1978, McDonald guided David R. Avery through the whole process and gave him full credit. The fourth edition in 1983 “was very much a shared piece of work,” said Avery. In the sixth edition, a new author by the name of Jeffrey A. Dean was added, but it was not until the eighth edition that he would join the editorial team of McDonald and Avery. 2016 saw the book’s 50th anniversary 10th edition published. As they handed over the editorship to Dr. Dean, McDonald said: “As we entrust the continuing editions of this textbook to others, we reflect on the many rewards we have realized by our participation in the previous editions. There are rewards for students, colleagues who teach and/or practice pediatric dentistry and most importantly their patients.” He went on: “We wish Godspeed to Dr. Dean...., and all other future contributors as they proceed with this work of love. We have the utmost confidence in their abilities to carry on.”

Dentistry for the Child and Adolescent is internationally popular and has been considered a classic text for graduate programs worldwide. It has been translated from English into several foreign languages, including Chinese, Farsi, Japanese, Italian, Portuguese, Spanish, and Russian. The textbook is now the world’s longest-running children’s dentistry textbook (Fig. 3).

The specialty of pediatric dentistry has grown over the past century in popularity. For the 2020–21 academic year, the number of positions offered and residency positions filled surpasses all specialties and advanced education in general dentistry programs. *McDonald and Avery's Dentistry for the Child and Adolescent* has grown alongside, providing graduates and specialists with knowledge, science, and technique as envisioned by McDonald so many years ago.



Fig. 3 The late Dr. Ralph E. McDonald (middle) with Dr. David R. Avery (left) and Dr. Jeffrey A. Dean (right), celebrating in 2000 the release of the 7th edition of the textbook. With that edition becoming the pediatric dentistry textbook with the most editions ever by surpassing Hogeboom’s total of 6 editions, Drs. Avery and Dean honored Dr. McDonald with a new world record gold medal and olive wreath.

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Preface and Acknowledgements

It is a great pleasure for me to introduce the next iteration of this long standing and successful textbook on the essence, foundation, and innovations in the science and practice of pediatric dentistry. After formally requesting and receiving fantastic feedback, compliments, and suggestions from a broad representation of notable academics and clinicians, as well as adding two new associate editors with specific expertise in their areas covered in the text, we analyzed, planned, and developed this edition to continue the nearly 60-year history of the book.

As I am writing this introduction, the world is mired in the Covid-19 pandemic and slowly learning how to adapt to the “new abnormal.” While impacting our care and practice, this remains an exciting time in dentistry and specifically pediatric dentistry, as new concepts, research,

techniques and philosophies continue to positively impact outcomes for our child and young adult patients. Increased emphasis on patient, centered care, parent and child consent and assent, continued public health and private practice improvements, advances in minimalist approaches to restorative care, new science on dental materials, pulp regeneration and revascularization, as well as a wide array of other advances, have enhanced our abilities to care for our patients and have been incorporated into these chapters.

Specifically, I am pleased to highlight a few additions and significant updates:

- Thirteen new authors have been added
- Complete update of the online video contribution with the expertise of a new video producer



**Front row, left to right: Jones, Dean
Back row, left to right: Yepes, Vinson, Sanders**

- Rewrite of the community dentistry chapter with three critical components—dental workforce, dental delivery sites and organizations, and payment source
- Updates on preventive, interceptive, and early orthodontic treatment, including information on pediatric sleep apnea
- New emphasis on the use of silver diamine fluoride
- New author update of the oral pathology chapter
- New section on vaping and oral implications
- Updated pain management section related to opioid use and misuse
- New section on pediatric dental bleaching
- Information on coronavirus and Covid-19 in children
- Updated on Periodontal Classification for children
- Expert Consult website with fully searchable access to the text, videos and multiple-choice questions

All of these enhancements take the assistance and dedication of multiple people. In particular, I'd like to thank all the great support staff at the Indiana University School of

Dentistry, in particular Terry Wilson, Jr. and Caleb Clements for their excellent production and editing work on all of the new videos, Amy Edmunds, Joyce Marlatt and Jasmine Pence for their administrative support, Abby Morgan and Nicole Alderson in dental illustrations for their work, and Sean Stone for his guidance on the citation reference manager.

I'm proud of the dedication and work of our associate editors and authors for once again helping to maintain the tradition of excellence established by our mentors and predecessors, Drs. McDonald and Avery. We hope you enjoy this new edition, and as always, I look forward to your comments and constructive criticism as we continuously strive for improvement and the highest in quality. All the best to you, our colleagues, friends, and students.

Jeffrey A. Dean

1

Examination of the Mouth and Other Relevant Structures

JUAN F. YEPES and JEFFREY A. DEAN

CHAPTER OUTLINE

Introduction

Initial Parental Contact with the Dental Office

The Diagnostic Method

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Emergency Dental Treatment

Introduction

A dentist is traditionally taught to perform a complete oral examination of the patient and to develop a treatment plan based on the examination findings. The dentist subsequently makes a case presentation to the patient or parents, outlining the recommended course of treatment. This process should include the development and presentation of a prevention plan that outlines an ongoing comprehensive oral health care program for the patient and establishment of the “dental home.”

The plan should include recommendations designed to correct the existing oral problems (or halt their progression) and to prevent anticipated future problems. It is essential to obtain all relevant patient and family information, to secure parental consent, and to perform a complete examination before embarking on this comprehensive oral health care program for pediatric patients. *Anticipatory guidance* is the term often used to describe the discussion and implementation of such a plan with the patient and/or parents. The American Academy of Pediatric Dentistry has published guidelines¹ concerning the periodicity of examination, preventive dental services, and oral treatment for children as summarized in [Table 1.1](#).

Each pediatric patient should be given an opportunity to receive complete dental care. The dentist should not attempt to decide what the child, the parents, or a third-party agent will accept or can afford. If parents reject a portion or all of the recommendations, the dentist has at least fulfilled the obligation of educating the child and the parents about the importance of the recommended

procedures. Parents with even moderate income usually find the means to have oral health care performed if the dentist explains that the child’s future oral health and even general health are related to the correction of the oral defects.

Initial Parental Contact with the Dental Office

We most often think of parents’ first contact with the dental office as being by telephone or electronic contact formats (Instagram, Facebook, etc). This initial conversation between the parent and the office receptionist is very important. It provides the first opportunity for the receptionist to attend to the parents’ concerns by pleasantly and concisely responding to questions and by offering an office appointment. The receptionist must have a warm, friendly voice and the ability to communicate clearly. The receptionist’s responses should assure the parent that the well-being of the child is the chief concern.

The information recorded by the receptionist during this conversation constitutes the initial dental record for the patient. Filling out a patient information form is a convenient method of collecting the necessary initial information. Of course, most dental practices are moving toward online, website-driven information and completion of patient forms for use even before a parent calls an office for an appointment or schedules an appointment online. Practices need to make accommodations to their patient information systems to manage these very productive changes.

TABLE 1.1 Recommendations for Pediatric Oral Health Assessment, Preventive Services, and Anticipatory Guidance/Counseling

Since each child is unique, these recommendations are designed for the care of children who have no contributing medical conditions and are developing normally. These recommendations will need to be modified for children with special health care needs or if disease or trauma manifests variations from normal. The American Academy of Pediatric Dentistry (AAPD) emphasizes the importance of very early professional intervention and the continuity of care based on the individualized needs of the child. Refer to the text of this guideline for supporting information and references. Refer to the text in the Guidelines on Periodicity of Examinations, Preventive Dental Services, Anticipatory Guidance, and Oral Treatment for Infants, Children, and Adolescents (www.aapd.org/media/Policies_Guidelines/G_Periodicity.pdf) for supporting information and references.

	AGE				
	6–12 months	12–24 months	2–6 years	6–12 years	≥12 years
Clinical oral examination ¹	•	•	•	•	•
Assesses oral growth and development ²	•	•	•	•	•
Caries-risk assessment ³	•	•	•	•	•
Radiographic assessment ⁴	•	•	•	•	•
Prophylaxis and topical fluoride ^{3,4}	•	•	•	•	•
Fluoride supplementation ⁵	•	•	•	•	•
Anticipatory guidance/counseling ⁶	•	•	•	•	•
Oral hygiene counseling ⁷	Parent	Parent	Patient/parent	Patient/parent	Patient
Dietary counseling ⁸	•	•	•	•	•
Injury prevention counseling ⁹	•	•	•	•	•
Counseling for nonnutritive habits ¹⁰	•	•	•	•	•
Counseling for speech/language development	•	•	•	•	•
Assessment and treatment of developing malocclusion			•	•	•
Assessment for pit-and-fissure sealants ¹¹			•	•	•
Substance abuse counseling				•	•
Counseling for intraoral/perioral piercing				•	•
Assessment and/or removal of third molars					•
Transition to adult dental care					•

¹First examination at the eruption of the first tooth and no later than 12 months. Repeat every 6 months or as indicated by child's risk status/susceptibility to disease. Includes assessment of pathology and injuries.

²By clinical examination.

³Must be repeated regularly and frequently to maximize effectiveness.

⁴Timing, selection, and frequency determined by child's history, clinical findings, and susceptibility to oral disease.

⁵Consider when systemic fluoride exposure is suboptimal. Up to at least 16 years of age or later in high-risk patients.

⁶Appropriate discussion and counseling should be an integral part of each visit for care.

⁷Initially, responsibility of parent; as child matures, jointly with parent; then, when indicated, only child.

⁸At every appointment; initially discuss appropriate feeding practices, followed by the role of refined carbohydrates and frequency of snacking in caries development and childhood obesity.

⁹Initially for play objects, pacifiers, car seats; then while learning to walk; and then with sports and routine playing, including the importance of mouthguards.

¹⁰At first, discuss the need for additional sucking: digits vs. pacifiers; then the need to wean from the habit before malocclusion or skeletal dysplasia occurs. For school-aged children and adolescent patients, counsel regarding any existing habits such as fingernail biting, clenching, or bruxism.

¹¹For caries-susceptible primary molars, permanent molars, premolars, and anterior teeth with deep pits and fissures; placed as soon as possible after eruption.

The Diagnostic Method

Before making a diagnosis and developing a treatment plan, the dentist must collect and evaluate the facts associated with the patient's or parents' chief concern and any other identified problems that may be unknown to the patient or parents. Some pathognomonic signs may lead to an almost immediate diagnosis. For example, obvious gingival swelling and drainage may be associated with a single, badly carious primary molar. Although these associated facts are collected and evaluated rapidly, they provide a diagnosis only for a single problem area. On the other hand, a comprehensive diagnosis of all of the patient's problems or potential problems may sometimes need to be postponed until more urgent conditions are resolved. For example, a patient with necrotizing ulcerative gingivitis or a

newly fractured crown needs immediate treatment, but the treatment will likely be only palliative, and further diagnostic and treatment procedures will be required later.

The importance of thorough collection and evaluation of the facts concerning a patient's condition cannot be over-emphasized. A thorough examination of the pediatric dental patient includes an assessment of the following:

- General growth and health
- Diet
- Chief complaint, such as pain
- Extraoral soft tissue and temporomandibular joint (TMJ) evaluation
- Intraoral soft tissue

- Oral hygiene and periodontal health
- Intraoral hard tissue
- Developing occlusion
- Caries risk
- Behavior

Additional diagnostic aids are often also required, such as radiographs, study models, photographs, pulp tests, and, infrequently, laboratory tests. In certain unusual cases, all of these diagnostic aids may be necessary before a comprehensive diagnosis can be made. Certainly, no oral diagnosis can be complete unless the diagnostician has evaluated the facts obtained by medical and dental history taking, inspection, palpation, exploration (if teeth are present), and often imaging (e.g., radiographs). For a more thorough review of evaluation of the dental patient, refer to the chapter by Glick et al.² in *Burket's Oral Medicine*.

Preliminary Medical, Dental, Family, and Social History

It is important for the dentist to be familiar with the medical, dental, family, and social history of the pediatric patient. Familial history may also be relevant to the patient's oral condition and may provide important diagnostic information in some hereditary disorders. Before the physical examination is performed, the dentist can obtain sufficient information to provide with knowledge of the child's general health from the parent or the child's physician. Dental assistants as well as dental hygienists can start collecting information/pre-screening with the parents. The dentist will follow this initial contact and expand or explore in more detail issues with a clear repercussion in the treatment plan. The form illustrated in Fig. 1.1 can be completed by the parent. However, it is more effective for the dentist to ask the questions marked by the parents and obtain more critical details to have a better prospective of the patient. The questions included on the form will also provide information about any previous dental treatment.

Information regarding the child's social and psychological development is important. Accurate information reflecting a child's learning, behavioral, or communication problems is sometimes difficult to obtain initially, especially when the parents are aware of their child's developmental disorder but are reluctant to discuss it. Behavior problems in the dental office are often related to the child's inability to communicate with the dentist and to follow instructions. This inability may be attributable to a learning disorder. An indication of learning disorders can usually be obtained by the dentist when asking questions about the child's learning process; for example, asking a young school-aged child how he or she is doing in school is a good lead question. The questions should be age appropriate for the child.

If a young child was hospitalized previously for general anesthetic and surgical procedures, it should be noted. Hospitalization and procedures involving general anesthesia can be a traumatic psychological experience for a preschool child and may sensitize the youngster to procedures that will be encountered later in a dental office.³ If the dentist is aware that a child was previously hospitalized or that the child fears strangers in clinic attire, the necessary time and

procedures can be planned to help the child overcome the fear and accept dental treatment.

Occasionally, when the parents report significant disorders, it is best for the dentist to meet privately. They are more likely to discuss the child's problems openly, and there is less chance for misunderstandings regarding the nature of the disorders. In addition, the dentist's personal involvement at this early time strengthens the parents' confidence. When an acute or chronic systemic disease or anomaly is indicated, the dentist should consult the child's physician to learn the status of the condition, the long-range prognosis, and the current drug therapy.

When a patient's medical and dental history is recorded, the presence of current illnesses or history of relevant disorders signals the need for special attention. In addition to consulting the child's physician, the dentist may decide to record additional data concerning the child's current physical condition, such as blood pressure, body temperature, heart sounds, height and weight, pulse, and respiration. Before any treatment is initiated, certain laboratory tests may be indicated and special precautions may be necessary. A decision to provide treatment in a hospital that possibly involves general anesthesia may be appropriate.

The dentist and the staff must also be alert to identify potentially communicable infectious conditions that threaten the health of the patient and others. Knowledge of the current recommended childhood immunization schedule is helpful. It is advisable to postpone nonemergency dental care for a patient exhibiting signs or symptoms of acute infectious disease until the patient recovers. Further discussions of management of dental patients with special medical, physical, or behavioral problems are presented in Parts III and V.

The pertinent facts of the medical history can be transferred to the oral examination record (Fig. 1.2) for easy reference by the dentist. A brief summary of important medical information serves as a convenient reminder to the dentist and the staff, who will refer to this chart at each treatment visit.

The patient's dental history should also be summarized on the examination chart. This should include a record of previous care in the dentist's office and the facts related by the patient and parent(s) regarding previous care, if any, in another office. Information concerning the patient's current oral hygiene habits and previous and current fluoride exposure helps the dentist develop an effective dental disease prevention program. For example, if the family drinks well water, a sample may be sent to a water analysis laboratory to determine the fluoride concentration.

Clinical Examination

Most facts needed for a comprehensive oral diagnosis in the young patient are obtained by thorough clinical and radiographic examination. In addition to examining the oral cavity structures, the dentist may wish to note the patient's size, stature, gait, or involuntary movements in some cases. The first clue to malnutrition may come from observing a patient's abnormal size or stature. Similarly, the severity of a child's illness, even if oral in origin, may be recognized by observing a weak, unsteady gait or lethargy and malaise as the patient walks into the office. All relevant information should be noted on the oral examination record (Fig. 1.2), which becomes a permanent part of the patient's chart.

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DOB: _____ EDR: _____
 NA: _____
 LC: _____ DATE: _____

MEDICAL / DENTAL HISTORY

Patient Name: _____ Birth Date: _____ Gender: Female Male
 City & State of Birth: _____ Race: _____ Height: _____ Weight: _____
 Primary Care Physician: _____ Previous Dentist: _____
 Physician Address: _____ Dentist Phone: _____
 Physician Phone: _____ Last Dental Visit: _____
 Date of Last Medical Exam: _____ Last Dental X-rays: _____

Dental History:

What is the primary reason for today's visit? _____
 Is patient in pain? YES NO Explain: _____
 Has patient had an injury to the mouth, teeth, or jaw? YES NO Explain: _____
 What is patient's primary water source: Private Well City Water, City Name: _____ Other: _____
 Was/is patient Breastfed or Bottle-fed Until what age? Breastfed: _____ Bottle-fed: _____
 How often does patient brush teeth? _____ With Help Without Help How often does patient floss? _____
 Does patient...
 Yes / No Yes / No Yes / No
 Suck Thumb/Fingers Bite/Chew Finger Nails Clench/Grind Teeth
 Use Pacifier Have Speech Issues Mouth Breather

Medical History:

Is patient currently under the care of a doctor? YES NO Explain: _____
 Does patient have allergies? YES NO Explain: _____
 Is patient taking medications? YES NO Please list all medications and natural remedies. Additional items may be listed on the back

Medication Name:	Dose:	Frequency of Use:
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Has patient had surgery or been hospitalized? YES NO
Hospital Facility: _____ **When:** _____ **Reason:** _____

Does patient have / or had any of the following:

Yes / No	Yes / No	Yes / No
<input type="checkbox"/> <input type="checkbox"/> Congenital Heart Defect/Disease	<input type="checkbox"/> <input type="checkbox"/> Visual/Hearing Impairment	<input type="checkbox"/> <input type="checkbox"/> Failure to Thrive
<input type="checkbox"/> <input type="checkbox"/> Heart Surgery	<input type="checkbox"/> <input type="checkbox"/> Abnormal Bleeding Issues	<input type="checkbox"/> <input type="checkbox"/> Eating Disorders
<input type="checkbox"/> <input type="checkbox"/> Heart Murmur	<input type="checkbox"/> <input type="checkbox"/> Sickle Cell Trait/Disease	<input type="checkbox"/> <input type="checkbox"/> Born Prematurely
<input type="checkbox"/> <input type="checkbox"/> High Blood Pressure	<input type="checkbox"/> <input type="checkbox"/> Hemophilia	<input type="checkbox"/> <input type="checkbox"/> Immunizations
<input type="checkbox"/> <input type="checkbox"/> Rheumatic Fever	<input type="checkbox"/> <input type="checkbox"/> Anemia	<input type="checkbox"/> <input type="checkbox"/> Hepatitis A, B, C
<input type="checkbox"/> <input type="checkbox"/> Asthma/Breathing Issues	<input type="checkbox"/> <input type="checkbox"/> Kidney Problems	<input type="checkbox"/> <input type="checkbox"/> Blood/Blood Product Transfusion
<input type="checkbox"/> <input type="checkbox"/> Cerebral Palsy	<input type="checkbox"/> <input type="checkbox"/> Liver Problems	<input type="checkbox"/> <input type="checkbox"/> HIV/AIDS
<input type="checkbox"/> <input type="checkbox"/> Seizures/Convulsions/Epilepsy	<input type="checkbox"/> <input type="checkbox"/> Diabetes	<input type="checkbox"/> <input type="checkbox"/> Varicella Vaccine / Chicken Pox
<input type="checkbox"/> <input type="checkbox"/> Learning/Communication Problems	<input type="checkbox"/> <input type="checkbox"/> Muscle/Joint/Bone Problems	<input type="checkbox"/> <input type="checkbox"/> TB / Tuberculosis
<input type="checkbox"/> <input type="checkbox"/> Autism	<input type="checkbox"/> <input type="checkbox"/> Thyroid/Glandular Problems	<input type="checkbox"/> <input type="checkbox"/> MRSA
<input type="checkbox"/> <input type="checkbox"/> ADD/ADHD	<input type="checkbox"/> <input type="checkbox"/> Skin Problems / Hives / Cold Sores	<input type="checkbox"/> <input type="checkbox"/> Limited Mobility

I affirm that the information provided above is correct to the best of my knowledge. It will be held in confidence and it is my responsibility to inform this office if there is a change in the health history of this patient. I authorize the release of this information to additional healthcare providers as is necessary for the dental treatments of this patient.

Guardian Signature: _____ Relationship to Patient: _____
 Resident Signature: _____ Date: _____ Time: _____



Fig. 1.1 Form used in completing the preliminary medical and dental history. (Printed with permission from Indiana University–University Pediatric Dentistry Associates.)



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Place Patient Label Here

OFFICE USE ONLY

Patient Name: _____
Last First MI

DOB _____ Record #: _____

ORAL EXAMINATION RECORD

Address: Same New _____ Telephone: Same New _____
 *** New address and/or phone number must be noted here and updated in practice software.

MEDICAL HISTORY SUMMARY	Last History Completed: _____ Update Due: _____ Weight: _____
	Current Medication Status & Medication Usage: _____

DENTAL HISTORY SUMMARY	Date of Last Exam: _____ Last Radiographs: B.W.: _____ A.O.: _____ P.A.: _____ F.M.: _____
	Appliances: _____ Last Cemented: _____ Last Replaced: _____
	Description of Present Problem: _____
	Summary of Prior Treatment: _____

EXTRA-ORAL FINDINGS	Head: _____ Neck: _____
	Face: _____ Lips: _____ Hands: _____

INTRA-ORAL FINDINGS	Palate and Oropharynx: _____ Airway: I II III IV
	Tongue and Floor of Mouth: _____ Buccal Mucosa: _____
	Frena: _____ Gingivae and Periodontium: _____

OCCLUSION REVIEW	Facial Profile: _____ Molar Relationship: PRIMARY (Terminal Plane): R L PERMANENT: R L Straight <input type="checkbox"/> <input type="checkbox"/> Molar <input type="checkbox"/> <input type="checkbox"/> Mes. Step <input type="checkbox"/> <input type="checkbox"/> End to End <input type="checkbox"/> <input type="checkbox"/> Dist. Step <input type="checkbox"/> <input type="checkbox"/> Class _____ Primate Space <input type="checkbox"/> <input type="checkbox"/> Canine _____ Canine Relationship _____ Midline: Normal <input type="checkbox"/> Deviated <input type="checkbox"/> Maxilla _____ mm R <input type="checkbox"/> L <input type="checkbox"/> Mandible _____ mm R <input type="checkbox"/> L <input type="checkbox"/> Mandibular: Shift R <input type="checkbox"/> L <input type="checkbox"/> Ant. <input type="checkbox"/> _____ mm
	Incisor Relationship: Overjet _____ mm Overbite _____ % Openbite _____ mm Arch Length: (General Impression) Maxilla Adequate <input type="checkbox"/> Inadequate <input type="checkbox"/> Mandible Adequate <input type="checkbox"/> Inadequate <input type="checkbox"/> Eruption Sequence & Timing: Normal <input type="checkbox"/> Describe <input type="checkbox"/>

TMJ and Function:	Opening Path: Normal <input type="checkbox"/> Deviated <input type="checkbox"/> Closing Path: Normal <input type="checkbox"/> Deviated <input type="checkbox"/> Opening: _____ mm Normal <input type="checkbox"/> Limited <input type="checkbox"/> Muscle Tenderness: _____ Tongue Function: _____ Crossbite: _____ Oral Habits: _____ Analysis Recommended: YES <input type="checkbox"/> NO <input type="checkbox"/>
	Joint Sounds: None Left Right Opening <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Closing <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Crepitus <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Supernumerary Teeth/ Congenitally Missing Teeth: _____ Ectopic Eruption: _____ Other Anomalies: _____

Fig. 1.2 Chart used to record the oral findings and the treatment proposed for the pediatric patient. (Printed with permission from Indiana University–University Pediatric Dentistry Associates.)

ORAL EXAM RECORD

Patient Name: _____

Date of Birth: _____ ACT#: _____

HARD TISSUE EXAMINATION

		Clinical	Radiographic			Clinical	Radiographic
	1				16		
	2				15		
	3				14		
A	4			J	13		
B	5			I	12		
C	6			H	11		
D	7			G	10		
E	8			F	9		
P	25			O	24		
Q	26			N	23		
R	27			M	22		
S	28			L	21		
T	29			K	20		
	30				19		
	31				18		
	32				17		

Plaque Score: A B C D F

Prior Score: _____

Fluoride Status: _____

Brushing / Flossing: _____

Habits: _____

Periodontal: _____

Periodontal Screening & Recording: _____

DIAGNOSTIC SUMMARY

Behavior: _____

Eruption sequence: _____

Occlusion: _____

Caries: _____

Caries Risk Assessment: Low Moderate High

Upper Right

TREATMENT PROPOSED

Upper Left

Lower Right

Lower Left

Treatment sequence, additional notations:

- 1.
- 2.
- 3.
- 4.
- 5.

Instructions given:

Assistant

Resident

Faculty Instructor

The clinical examination, whether the first examination or a regular recall examination, should be all inclusive. The dentist can gather useful information while getting acquainted with a new patient. Attention to the patient's hair, head, face, neck, and hands should be among the first observations made by the dentist after the patient is seated in the chair.

The patient's hands may reveal information pertinent to a comprehensive diagnosis. The dentist may first detect an elevated temperature by holding the patient's hand. Cold, clammy hands or bitten fingernails may be the first indication of abnormal anxiety in the child. A callused or unusually clean digit suggests a persistent sucking habit. Clubbing of the fingers or a bluish color in the nail beds suggests congenital heart disease, which may require special precautions during dental treatment.

Inspection and palpation of the patient's head and neck are also indicated. Unusual characteristics of the hair or skin should be noted. The dentist may observe signs of problems such as head lice (Fig. 1.3), ringworm (Fig. 1.4), impetigo (Fig. 1.5A,B), herpes labialis, or pink eye during the examination. Proper referral is indicated immediately because these conditions are contagious. After the child's physician has supervised treatment to control the condition, the child's dental appointment may be rescheduled. If a contagious condition is identified, but the child also has a dental emergency, the dentist and the staff must take appropriate precautions to prevent spread of the disease to others while the emergency is alleviated. Further treatment should be postponed until the contagious condition is controlled.

Variations in the size, shape, symmetry, or function of the head and neck structures should be recorded. Abnormalities of these structures may indicate various syndromes or conditions associated with oral abnormalities.

Temporomandibular Evaluation

A systematic review and meta-analysis published by da Silva et al.⁴ assessed the prevalence of clinical signs of temporomandibular (TMJ) disorders in children and adolescents. One in six children and adolescents has clinical signs of disorders. Okeson⁵ published a special report on TMJ disorders in children, indicating that although several studies included children aged 5–7 years, most observations have been made in young adolescents. Studies have placed the findings into the categories of symptoms or signs—those reported by the child or parents and those identified by the dentist during the examination. Prevalence of signs and symptoms increases with age and may occur in 30% of patients.

One should evaluate TMJ function by palpating the head of each mandibular condyle and by observing the patient while the mouth is closed (teeth clenched), at rest, and in various open positions (Fig. 1.6A–D). Movements of the condyles or jaw that do not flow smoothly or that deviate from the expected norm should be noted. Similarly, any crepitus that may be heard or identified by palpation as well as any other abnormal sounds should be noted. Sore masticatory muscles may also signal TMJ dysfunction. Such deviations from normal TMJ function may require further evaluation and treatment. There is a consensus



Fig. 1.3 Evidence of head lice infestation. Usually the insects are not seen, but their eggs or nits cling to hair filaments until they hatch. (Courtesy Dr. Hala Henderson.)



Fig. 1.4 Lesion on the forehead above the left eyebrow is caused by ringworm infection. Several fungal species may cause lesions on various areas of the body. The dentist may identify lesions on the head, face, or neck of a patient during a routine clinical examination. (Courtesy Dr. Hala Henderson.)

that temporomandibular disorders in children can be managed effectively by the following conservative and reversible therapies: patient education, mild physical therapy, behavioral therapy, medications, and occlusal splints.⁶ Discussion of the diagnosis and treatment of complex TMJ disorders is available from many sources; we suggest Okeson's *Management of Temporomandibular Disorders and Occlusion* (2020).⁷

The extraoral examination continues with palpation of the patient's neck and submandibular area (Fig. 1.6C and D). Again, deviations from normal, such as unusual tenderness or enlargement, should be noted and follow-up tests performed or referrals made as indicated.

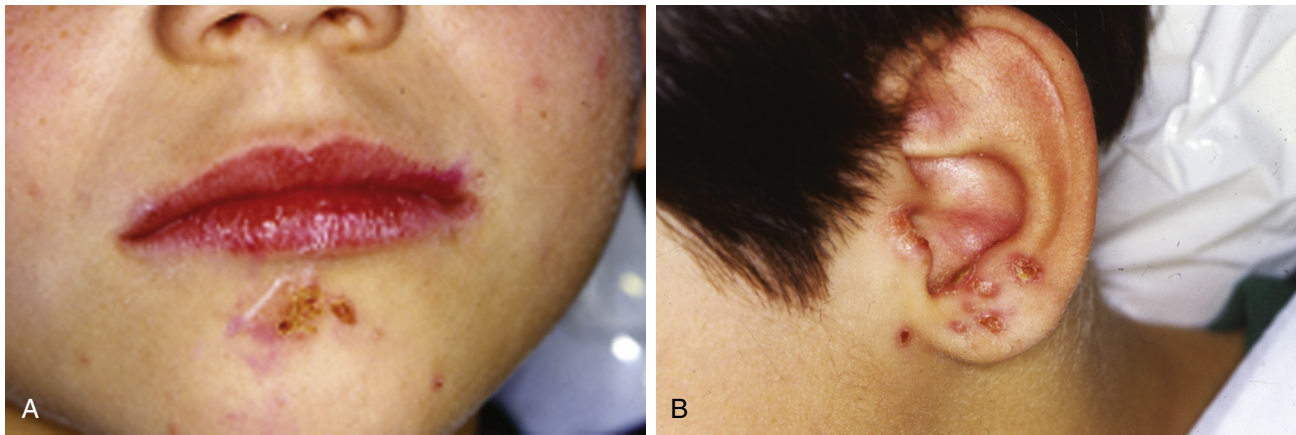


Fig. 1.5 Characteristic lesions of impetigo on the (A) lower face and (B) left ear. These lesions occur on various skin surfaces, but the dentist is most likely to encounter them on upper body areas. The infections are of bacterial (usually streptococcal) origin and generally require antibiotic therapy for control. The child often spreads the infection by scratching the lesions. (Courtesy Dr. Hala Henderson.)



Fig. 1.6 (A) and (B) Observation and palpation of the temporomandibular joint function. (C) and (D) Palpation of the neck and submandibular areas.

If the child is old enough to talk, speech should be evaluated. The positions of the tongue, lips, and perioral musculature during speech, while swallowing, and at rest may provide useful diagnostic information.

The intraoral examination of a pediatric patient should be comprehensive. There is a temptation to look first for obvious carious lesions. Although controlling carious lesions is important, the dentist should first evaluate the condition of the oral soft tissues and the status of

the developing occlusion. If the soft tissues and the occlusion are not observed early in the examination, the dentist may become so engrossed in charting carious lesions and in planning for their restoration that other important anomalies in the mouth are overlooked. Furthermore, any unusual breath odors and abnormal quantity or consistency of saliva should also be noted.

The buccal tissues, lips, floor of the mouth, palate, and gingivae should be carefully inspected and palpated (Fig. 1.7A–C).

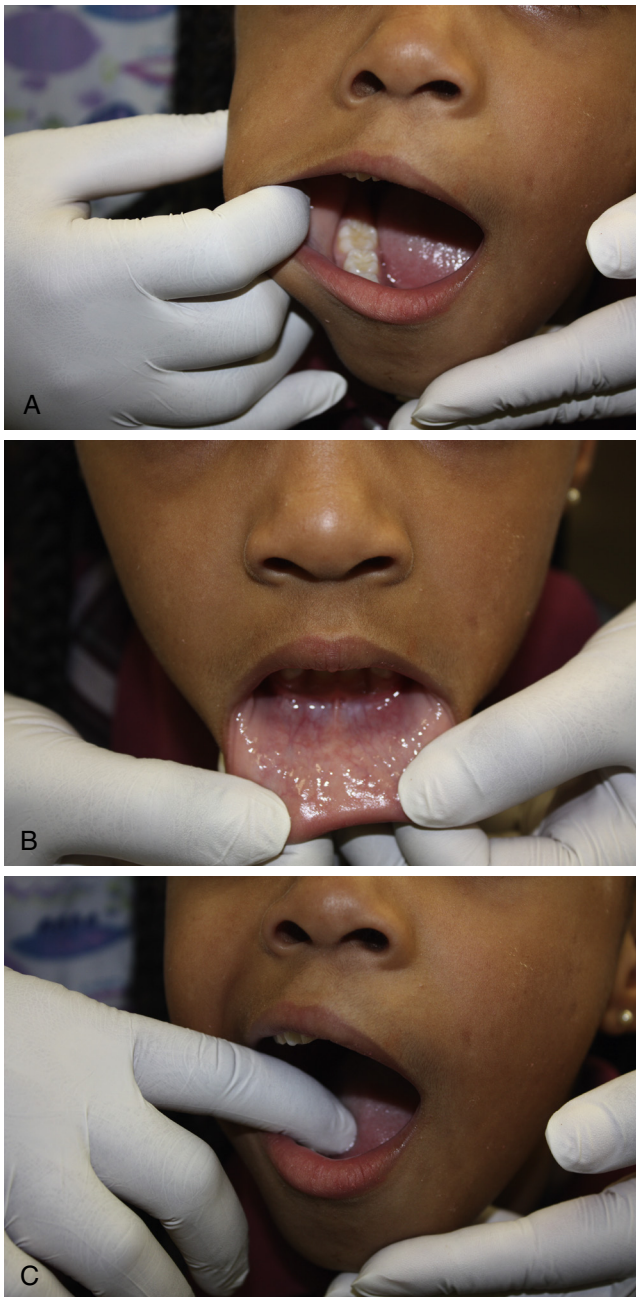


Fig. 1.7 Inspection and palpation of the (A) buccal tissues, (B) lips, and (C) floor of the mouth.

The use of the periodontal screening and recording program (PSR) is often a helpful adjunct when working with children. PSR is designed to facilitate early detection of periodontal diseases with a simplified probing technique and minimal documentation. Clerehugh and Tugnait⁸ recommend initiation of periodontal screening in children following eruption of the permanent incisors and first molars. They suggest routine screening in these children at the child's first appointment and at regular recare appointments so that periodontal problems are detected early and treated appropriately. Immunodeficient children are especially vulnerable to early loss of bone support.

A more detailed periodontal evaluation is occasionally indicated, even in young children. Periodontal disorders of children are discussed further in [Chapter 15](#).

The tongue and oropharynx should be closely inspected. Enlarged tonsils accompanied by purulent exudate may be the initial sign of a streptococcal infection, which can lead to rheumatic fever. When streptococcal throat infection is suspected, immediate referral to the child's physician is indicated. In some cases, it may be helpful to the physician and convenient for the dentist to obtain a throat culture specimen while the child is still in the dental office, which contributes to an earlier definitive diagnosis of the infection. The diagnosis and treatment of soft tissue problems are discussed throughout this book (see [Chapters 5, 26, and 27](#).)

After thoroughly examining the oral soft tissues, the dentist should inspect the occlusion and note any dental or skeletal irregularities. The dentition and resulting occlusion may undergo considerable change during childhood and early adolescence. This dynamic developmental process occurs in all three planes of space, and with periodic evaluation the dentist can intercept and favorably influence undesirable changes. The patient's facial profile and symmetry; molar, canine, and anterior segment relationships; dental midlines; and relation of arch length to tooth mass should be routinely monitored in the clinical examination. More detailed evaluation and analysis are indicated when significant discrepancies are found during critical stages of growth and development. Diagnostic casts and cephalometric analyses may be indicated relatively early in the mixed-dentition stage and sometimes in the primary dentition. Detailed discussions of analyses of developing occlusions and interceptive treatment recommendations are presented in [Chapters 21, 22, and 23](#).

Finally, the teeth should be inspected carefully for evidence of carious lesions and hereditary or acquired anomalies. The teeth should also be counted and identified individually to ensure that supernumerary or missing teeth are recognized. Identification of carious lesions is important in patients of all ages, but it is especially critical in young patients because the lesions may progress rapidly in early childhood if not controlled. Eliminating the etiology of the caries activity, preventive management of the caries process, and restoration of cavitated lesions will prevent pain and the spread of infection and will contribute to the stability of the developing occlusion.

Since it is preferable for the dentist to perform the clinical examination of a new pediatric patient before the radiographic and prophylaxis procedures, it may be necessary to correlate radiographic findings or other initially questionable findings with the findings of a second brief oral examination. This is especially true when the new patient has poor oral hygiene. Detailed inspection and exploration of the teeth and soft tissues cannot be performed adequately until the mouth is free of extraneous debris.

During the clinical examination for carious lesions, each tooth should be dried individually and inspected under a good light. A definite routine for the examination should be established. For example, a dentist may always start in the upper right quadrant, work around the maxillary arch, move down to the lower left quadrant, and end the examination in the lower right quadrant. Morphologic defects and incomplete coalescence of enamel at the bases of pits and fissures in molar teeth can often be detected readily by visual and explorer examination after the teeth have been cleaned and dried. The decision whether to place a sealant

or to restore a defect depends on the patient's history of dental caries, the parents' or patient's acceptance of a comprehensive preventive dentistry program (including dietary and oral hygiene control), and the patient's dependability in returning for recare appointments.

In patients with severe dental caries, caries activity tests and diet analysis may contribute to the diagnostic process by helping define specific etiologic factors. These procedures probably have an even greater value in helping the patient and/or parents understand the dental caries disease process and in motivating them to make the behavioral changes needed to control the disease. The information provided to them should include instructions in plaque control and the appropriate recommendations for fluoride exposure. Dental caries susceptibility, caries disease process, caries activity tests, diet analysis, and caries control are discussed in [Chapter 10](#). Plaque control procedures and instructions are detailed in [Chapter 8](#).

The dentist's comprehensive diagnosis depends on the completion of numerous procedures but requires a thorough, systematic, and critical clinical examination. Any deviation from the expected or desired size, shape, color, and consistency of soft or hard tissues should be described in detail. The severity of associated problems and their causes must be clearly identified to the patient or parents before a comprehensive oral health care program can be expected to succeed.

During the initial examination and at subsequent appointments, the dentist and auxiliary staff members should be alert to signs and symptoms of child abuse and neglect. These problems are increasing in prevalence, and the dentist can play an important role in detecting their signs and symptoms; this subject is thoroughly covered in [Chapter 7](#).

Uniform Dental Recording

Many different tooth-charting systems are currently in use, including the universal system illustrated in the hard tissue examination section of [Fig. 1.2A and B](#). This system of marking permanent teeth uses the numbers 1 to 32, beginning with the upper right third molar (No. 1) and progressing around the arch to the upper left third molar (No. 16), down to the lower left third molar (No. 17), and around the arch to the lower right third molar (No. 32). The primary teeth are identified in the universal system by the first 20 letters of the alphabets, A through T. In case of a supernumerary tooth, in the permanent dentition the number 50 is added to the tooth number that is closest to the supernumerary tooth. In the primary dentition, the letter "S" is added to the tooth number that is the closest to the supernumerary tooth.⁹

The *Fédération Dentaire Internationale's* Special Committee on Uniform Dental Recording has specified the following basic requirements for a tooth-charting system:

1. Simple to understand and teach
2. Easy to pronounce in conversation and dictation
3. Easily communicable in writing and electronic format
4. Easy to translate into computer input
5. Easily adaptable to standard charts used in general practice

The committee found that only one system, the two-digit system, seems to comply with these requirements. According to this system, the first digit indicates the quadrant and the second digit the type of tooth within the quadrant. Quadrants are allotted the digits 1 to 4 for the permanent teeth and 5 to 8 for the primary teeth in a clockwise sequence, starting at the upper right side; teeth within the same quadrant are allotted the digits 1 to 8 (primary teeth, 1 to 5) from the midline backward. The digits should be pronounced separately; thus, the permanent canines are teeth one-three, two-three, three-three, and four-three.

In the "Treatment Proposed" section of the oral examination record ([Fig. 1.2B](#)), the individual teeth that require restorative procedures, endodontic therapy, or extraction are listed. Gingival areas requiring follow-up therapy are also noted. A checkmark can be placed beside each listed tooth and procedure as the treatment is completed. Additional notations concerning treatment procedures completed and the date are recorded on supplemental treatment record pages.

Radiographic Examination

When indicated, radiographic examination for children must be completed before a comprehensive oral health care plan can be developed (but after the detail clinical examination), and subsequent radiographs are required periodically to enable detection of incipient carious lesions or other developing anomalies.

A child should be exposed to dental ionizing radiation only after the dentist has determined that radiography is necessary to make an adequate diagnosis for the individual child at the time of the appointment.

Obtaining isolated occlusal, periapical, or bitewing films is sometimes indicated in very young children (even infants) because of trauma, toothache, suspected developmental disturbances, or proximal caries. It should be remembered that carious lesions appear smaller on radiographs than they actually are.

As early as 1967, Blayney and Hill¹⁰ recognized the importance of diagnosing incipient proximal carious lesions with the appropriate use of radiographs. If the pediatric patient can be motivated to adopt a routine of good oral hygiene supported by competent supervision, many of these initial lesions can be arrested. The dentist must be aware of other non-ionizing radiation techniques available for the detection of interproximal caries. Each technique (e.g., transillumination) comes with clear indications. The interpretation of the non-ionizing radiation techniques must be done carefully by the dentist.

Radiographic techniques for the pediatric patient are described in detail in [Chapter 2](#).

Early Examination

Historically, dental care for children has been designed primarily to prevent oral pain and infection, occurrence and progression of dental caries, premature loss of primary teeth, loss of arch length, and development of an association