# CDA

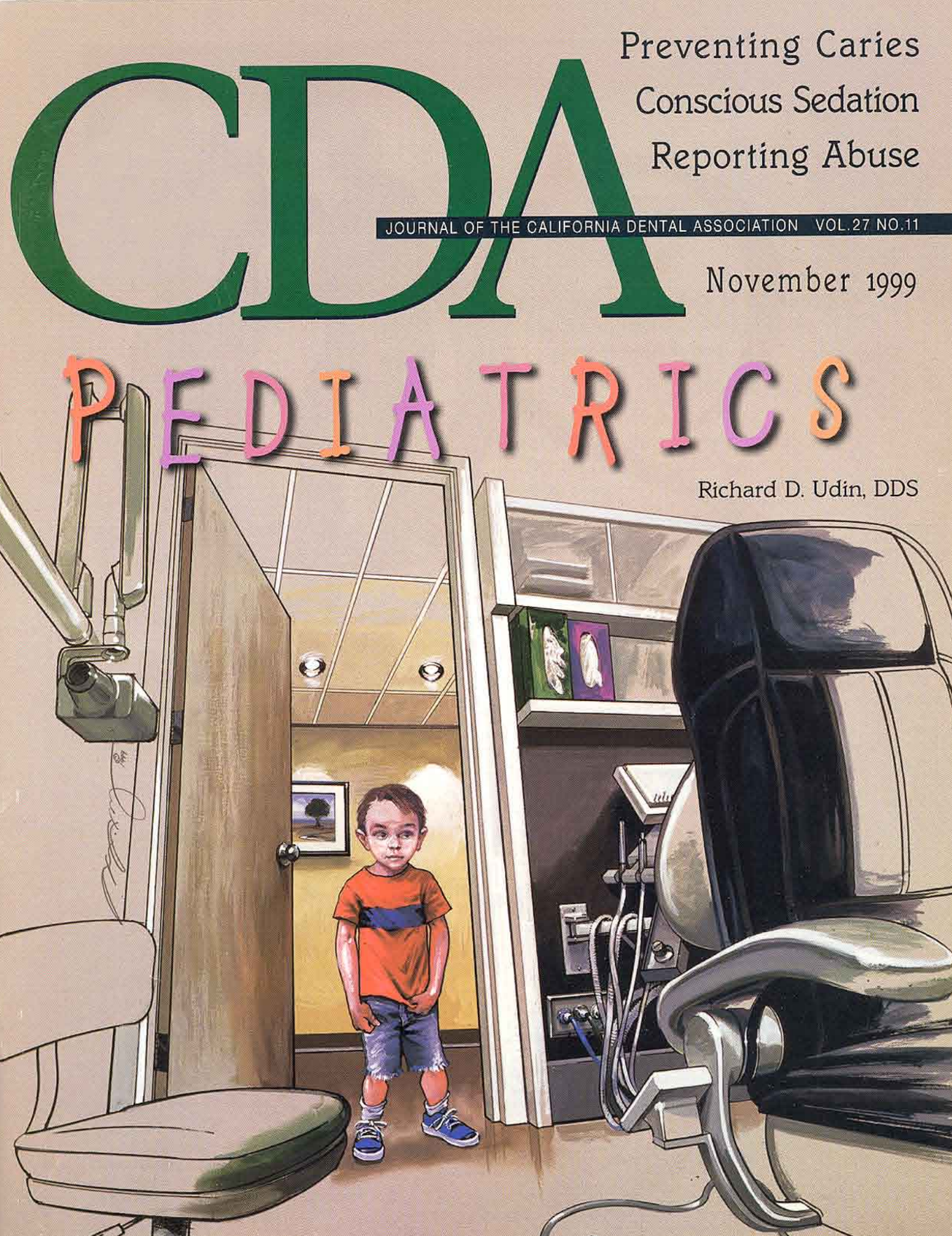
Preventing Caries
Conscious Sedation
Reporting Abuse

JOURNAL OF THE CALIFORNIA DENTAL ASSOCIATION VOL.27 NO.11

November 1999

# PEDIATRICS

Richard D. Udin, DDS



OF THE CALIFORNIA DENTAL ASSOCIATION
Journal
CDA Journal
Volume 27, Number 11
NOVEMBER 1999

## DEPARTMENTS



## FEATURES

CDA JOURNAL, VOL 27, Nº11

# A Remarkable Ride

Jack F. Conley, DDS

As we move ever closer to the end of the 20th century, it is worthwhile to review the historical development of the dental profession in America – a relatively young profession.

The founding of the American Dental Association in the 1850s marked the beginning of the profession we know today, although the first dental school program was established in 1839 at Baltimore College. Change in the first 50 years was not rapid when compared with the rate of change we have experienced in recent years, although there were events and influences worth mentioning. The work of G.V. Black may have been the most notable contribution to the advancement of the art and science of dentistry as it has been practiced for much of the 20th century. His texts on dental anatomy and cavity preparation in the 1890s were significant. Certainly, the first dental X-ray in 1896 contributed immensely to a more scientific approach to the diagnostic decisions of dentists in the years that followed. One aspect of growth during this half century was the organization of the profession. In addition to the ADA, the predecessor state organizations to the California Dental Association and some of the first component dental societies were formed.

The first 50 years of the 20th century were characterized by a strengthening of the scientific and technical foundations of the profession. Continuing contributions by Black and the inlay technique developed by William Taggart in 1907 strengthened the restorative emphasis that dominated dental practice for years. Dentistry in the first half of the century was primarily reparative and was provided to those who needed it or sought it and paid for it out of their own resources. Notable during this period was the Carnegie Foundation Report by William J. Gies. The report established a framework for professional education and training that has served the profession well over the years. Dental colleges would become affiliated with universities, eliminating the proprietary or commercial programs. This still stands as one of the most important influences on the development of the dental profession in this century. Also significant in the first half of the century was the acceptance of seven of the eight specialties in dentistry from 1947 to 1949. Endodontics followed in 1963.

While a few dentists may have operated their practices in a businesslike manner in the first 100 years, that focus would not really commence until the final half of the century. The American Academy of Dental Practice Administration (1956) was one of the first groups to promote management systems and efficiency in dental practice. The Dental Assistant Utilization Program, which garnered some federal support because of perceived staffing needs, brought a much-needed emphasis on such topics as organizational efficiency, personnel management, and chairside assistant utilization (four-handed dentistry) to the dental schools in the late 1950s. On the technique side, the late 1950s would see the introduction of high-speed air-driven and belt-driven handpieces. This equipment would facilitate the delivery of restorative treatment, making dentistry more user-friendly.

Access to dental care became a topic of more frequent discussion; and California Dental Service, which was initiated by the profession in 1955, brought increased access to dental care to many via dental benefits. The profession became active in efforts to fluoridate public water and to

CDA JOURNAL, VOL 27, Nº11

encourage preventive dentistry through school screenings, health fairs, and similar voluntary activities. Individual dentists and local dental groups have received positive recognition over the years for their community efforts to improve the dental health of the public. These continuing activities have undoubtedly contributed to a strong ranking for dentistry in many of the public image surveys taken in the past two decades.

The age of consumerism arrived in California in the 1970s with the appointment of the first consumer member to the California Board of Dental Examiners, Jennifer Cross. Prior to that time, only dentists served on the board. Advertising by professionals became permissible as a result of the Bates-O'Steen decision in 1977. Up to the time, dental professional codes of ethics had set the standards to which members were judged, and advertising had not been permitted by members of the organized profession. Many in the profession decried the changes forced upon it from the outside.

Increases in the education and graduation of new dentists and greater utilization of auxiliaries contributed to a staffing surplus in the first half of the 1980s. Institutional advertising by CDA and internal and external marketing plans developed either by or for individual practitioners were set in motion in this decade to bring patients into the dental chair to address the "busyness" crisis. Preferred provider organizations also appeared about 1984 and were promoted to dentists as a method of putting new patients in the dental chair. By 1984, AIDS would start to affect the infection control awareness of dentists and the public. Shortages of dental handpieces and their capability to withstand the temperatures required for sterilization were just two of the headaches experienced by many dentists as they endeavored to comply with new regulations and guidelines governing sterilization and infection control. While various forms of implants had been studied and tried without success in prior years, the latter years of the 1980s saw the emergence of osseointegrated dental implants as an important option for restoring function and cosmetics. The 1980s also marked noticeable improvement in the cosmetic and bonding characteristics of tooth-colored restorative materials.

New regulations, including the Bloodborne Pathogens Standard in 1991, would emerge to forever change and upgrade the standards in dental practice, helping to prevent transmission of infectious diseases such as hepatitis B and AIDS in the dental office. By the early 1990s, succeeding generations of the composite resin materials, porcelain veneers, and tooth-bleaching techniques had combined to add the potential for a significant emphasis in cosmetic treatment in general dental practice. The 1990s have been notable for the advancement of technology in dental practice. Significant numbers of practices have adopted computer management software. Electronic claims transmission and imaging systems have brought what was once considered the future into the present day in many practices. Some predict that the patient record will be paperless throughout the profession in just a few years.

At the organizational level, by the mid-90s, the profession had seen rather significant change in its composition, particularly in California. In recent years, efforts have been initiated to help the profession make the most of its increasing diversity in gender and ethnicity. There has long been a realization within organized dentistry that there is value to building one voice and avoiding the fragmentation that can weaken the mission of the profession.

To the dismay of many in organized dentistry in the 1990s, the increased costs of health care have encouraged dental benefits managers to adopt dental contract plans with managed care controls in an effort to contain the costs to employers. Underfunded plans in particular have incurred the wrath of many in the profession who believe they have forced dentists to compromise treatment quality and ethics.

Due to the complexity of the marketplace, significant numbers of dentists are now relying successfully on professional advisers -- such as practice management consultants and accountants -- who are skilled in assessing the needs and deficiencies of their clients. While some practitioners are critical of the business environment the contemporary practice must operate within, it has been our observation that those who have sought and followed the counsel of good advisers have been achieving their goals and are pleased with the progress of their practices.

While we may suffer from myopic vision because of our close contact with only the past 35 years of dentistry in this century, our quick summary should nonetheless show that this most recent period of development appears to feature the fastest and most remarkable change in the approximately 150 years of American dentistry. It is our belief that the strong technical and ethical foundations established in the first 100 years have made the changes due to advances in communication, technology, and new techniques of the past half century possible without chaos, even though some of the change has been unpleasant in the view of many dentists.

It is unlikely that the profession will ever again experience the level of growth and change seen in the last decades of this century. Undoubtedly, there will be changes in the mission of the profession resulting from continuing prevention efforts and the education of the populace to dentistry. This creates unknowns that make it extremely difficult to predict either the nature or rate of change in dentistry in the 21st century. What IS important at this time is to salute the significant achievements of this profession as this century comes to a close. Despite some criticism from within our ranks, in retrospect, it has been a remarkable ride.

CDA JOURNAL, VOL 27, Nº11

## The Business of Smiles

By David G. Jones

Image-conscious people with disposable incomes are being targeted by a new wave in cosmetic dentistry that is spreading across California and the nation. Many general dental practices can help patients achieve whiter teeth, but patients who want more immediate results are beginning to take advantage of a new type of bleaching.

BriteSmile, Inc., headquartered in Walnut Creek, Calif., is expanding the use of a new whitening technology in tooth whitening centers and some dental practices. The company has 12 current or soon-to-open locations in Northern and Southern California and is in eight other states and Canada.

With the new technology, treatment can be completed in about an hour, offering patients an alternative to traditional practice-based whitening systems that take two weeks or more to complete. According to a dentist who uses the new system, it's the latest in a series of whitening systems available to general dentists.

"We have been doing 'instant' bleaching with different methods for the past two years and for the past four years have included laser whitening. This is one more way to do it," says Robert Reyto, DDS, who works at a BriteSmile center in Beverly Hills, in addition to his own dental practice. "It's just a new state-of-the-art technology."

The system uses a proprietary gel that is applied to the patient's teeth. A special light that works on all teeth simultaneously activates the gel. The single-visit whitening system costs patients $500, more than the cost for traditional practice-based whitening systems.

The cost is offset by better control over the process, according to BriteSmile President Andrew Hofmeister.

"There is a wide body of literature that shows that dentists using a take-home tray system lose control of the patient's compliance with the regimen, so the dentist can't feel comfortable with the results a patient is likely to get," Hofmeister says. "With our new technology, dentists can show their patients where on the whiteness scale they're likely to wind up. Dentists can control the procedure, and they can guarantee the level of satisfaction."

Lawrence Addleson, DDS, chairman of the board of governors of the American Academy of Cosmetic Dentistry, says that there is a great deal of advertising to dentists for new or supposedly better bleaching systems.

"There are some manufacturers that advertise new solutions that they claim get teeth brighter, usually incorporating a tray system," he says. "But I've never seen a system like BriteSmile where all the teeth are done at one time."

Addleson says that even though the concept sounds interesting, he is concerned about the image of dentistry that the company's aggressive advertising program presents to the public.

"I'm certainly concerned it might have the same effect on dentistry as the overt advertising that plastic surgeons have done," he says. "We certainly don't want to diminish our image in the public eye."

Kevin Anderson, DDS, president of the California Academy of General Dentistry, sees another downside.

"I know there are some limitations in what they're doing," he says. "I've had three referrals myself from this procedure after problems have occurred and patients have had to follow up with someone else. Also, these procedures are not covered by insurance, and patients may also be paying more than they should. I think in general that patients are jumping on a bandwagon."

Anderson also says that in general dentistry the dentist is the gatekeeper of patients' general oral health, like the coach of a team.

"That's an important issue, whether it's implants, whitening, oral surgery or referral to an orthodontist," he says. "This team, including the specialties, has the general practitioner as coach, who should direct all aspects of a patient's oral care. In this regard, if patients ask about whitening, it's important that we refer them to avenues within dentistry."

Roger Rempfer, DDS, chair of CDA's Council on Dental Care says he believes there is a risk that this form of dental care will take some business from general dentists because patients may be more sensitive to cosmetic dentistry than the dentist is.

"The procedure has a lot of sizzle for the patient," he says. "It has an immediately perceived value and an immediate result."

Hofmeister says he disagrees with those who say that BriteSmile is taking away business from dentists.

"All dentists are open to use any technology they see fit," he says. "If our system has the broad access we hope it will, many dentists will be using this new technology in their offices, which ought to add to a practice's revenue."

Addleson says he considers the interest among patients for whiter teeth to be an opportunity for progressive dental offices, if they are prepared to answer patients' questions about whitening.

"Dentists can't afford to be in the dark about this," he says. "They need to offer some form of whitening to their patients or their practice may change in a direction they don't want. This is also one of those areas that gives dentists the opportunity to maintain a portion of a practice outside the managed care mode."

CDA JOURNAL, VOL 27, Nº11

## Blocking Perio Disease May Be Hormone Replacement Benefit

Postmenopausal women deciding whether to undergo hormone replacement therapy may be able to add another benefit to their list -- protecting their teeth.

A study published in the Journal of Periodontology suggests that estrogen supplementation in women within five years of menopause may slow the progression of periodontal disease.

Studies show that at least half of Americans older than 55 have periodontitis. Researchers have suspected that estrogen deficiency and osteopenia/osteoporosis speed the progression of oral bone loss following menopause. The new study concluded that estrogen supplementation may lower gingival inflammation and the frequency of attachment loss in women with signs of osteoporosis, thus helping to protect the teeth.

"For women at risk for osteoporosis, which likely makes them more vulnerable to rapid periodontal bone loss, this may be yet one more reason to be on estrogen," says the study's lead researcher, Dr. Richard Reinhardt, professor at the University of Nebraska Medical Center College of Dentistry. "However, female smokers should note that the study found that smoking had a greater impact on speeding the progression of periodontal disease than estrogen deficiency."

## Focus Falls on Children's Health

Dentists planning to get involved in raising awareness about children's dental health needs should begin now, since February is Children's Dental Health Month.

The American Dental Association has kits to help dentists plan events in their communities. Ideas include sponsoring a coloring contest, creating an exhibit at the local library, giving school presentations, and working with community and civic groups. Among the support items are sample press releases and news articles, Dudley the Dinosaur artwork, and activity sheets.

Contact ADA's Department of Public Information and Education for more information at (312) 440-2589.

## Direct Reimbursement Makes Solid Gains

The number of people who joined direct reimbursement dental plans surged 163 percent from 1997 to 1998, and the number of new DR plans implemented nationwide climbed nearly 100 percent, according to statistics from the ADA Purchaser Information Service.

With a total of 287 DR dental plans implemented in 1998, 101 in California, the fee-for-service option promoted by the ADA Purchaser Information Service as well as the California Dental Association, is carving out a growing segment of the dental benefits market. The growth in DR plans hardly compares to the 7,500-plus dental plans implemented by an insurance giant like the Guardian Life Insurance Co. of America, but it compares favorably to the growth experienced by Aetna Life Insurance Co. (557 new dental plans in 1998). It exceeds the growth experienced by Metropolitan Life Insurance Co. (145 new dental plans in 1998).

As for HMOs and PPOs, two recent articles in a Cincinnati newspaper and Employee Benefit News report that enrollment in dental health maintenance organizations was up 5 percent to 8 percent in 1998, and enrollment in dental preferred provider organizations was up more than 30 percent.

The articles, which cite statistics from the National Association of Dental Plans, also note that participation in traditional indemnity plans dropped 15 percent to 20 percent.

## Good Follow-Up Is Key In Blood Pressure Cases

Frequent dental visits following initial periodontal treatment may significantly reduce gingival overgrowth in patients taking nifedipine, a commonly prescribed medication for high blood pressure, according to a study in the Journal of Periodontology.

"This is good news for the 20 to 40 percent of patients taking nifedipine who experience discomfort from recurring gingival overgrowth and rely on nifedipine to control their high blood pressure," says Robert Genco, DDS, PhD, editor in chief of the *Journal*.

The study found that gingival overgrowth recurrence was eliminated in more than half of patients with a combination of initial periodontal therapy, including surgical and nonsurgical treatments, followed by dental visits every three months. This regimen appeared to affect recurrence more than previously known risk factors, such as gender, drug type, and duration of drug therapy.

## Hot Tips for Reducing Office Energy Bills

The Environmental Protection Agency offers the following list of tips to help small business keep their energy bills down in winter:

- Adjust the thermostats for colder weather. Set them at the lowest comfortable temperature. Cost: Nothing. Savings potential: Can be $1,000 for a small building.
- Open drapes or blinds in cooler months to let the sunshine warm the office and give the thermostat a break. Just do the opposite in the warmer

months. Cost: Nothing. Savings potential: About $5 per window.

- Check for drafts coming from doors and windows, then caulk and weatherstrip as necessary. Cost: $5 or less. Savings potential: About $2 per fixed draft.
- Clean all air filters monthly. Cost: Nothing. Savings potential: Up to $60 a year.
- Turn off computers and other office equipment overnight and on weekends. Cost: Nothing. Savings potential: Up to $44 per year, per computer.
- Install occupancy sensors where lights can be left off most of the time. Cost: Less than $100. Savings potential: Up to $40 per year.
- Turn off water heater overnight and on weekends. Cost: Nothing, or $30 if you buy an automatic timer. Savings potential: Up to $54 per year.
- Lower the temperature on the water heather. Cost: Nothing. Savings potential: About $24 per year, if the setting is reduced by 10 degrees.
- Install LED exit signs. They last 20 times longer than conventional exit signs. Cost: About $70 to retrofit. Savings potential: Up to $24 per year.
- Set back thermostats at night and on weekends. Cost: Nothing. Savings potential: About $1,800 per year for a 33,000 square foot building with a thermostat originally set at 75 degrees Fahrenheit, 24 hours per day during the heating months.

## Cooperation Is a Key

Dental health practitioners and child care providers need to work together to establish dental health programs for children in day care and training programs for child care staff, according to a West Virginia study published in the summer 1999 issue of the Journal of Dental Hygiene.

The study by Shelia S. Price, DDS, EdD, and Dina Agnone Vaughan, BSDH, MS, surveyed 119 child-care facilities in West Virginia. The study found that 63 percent of the responding child care facilities included toothbrushing in the children's daily schedule; 72 percent reported inviting dental health professionals to discuss dental health with the enrollees. However, it was less common (29 percent) for the dental health professionals to address the child care staffers regarding children's dental health.

Price and Agnone Vaughan found that a large number of facilities promote supervised toothbrushing after every meal or snack, even though state licensing requirements only call for daily toothbrushing.

"This additional preventive measure is an indication of their motivation to ensure children's dental well-being," they write.

The authors suggest that while the majority of child care centers in the study are in compliance with state requirements, there is an under-utilization of dental consultation and in-staff training on oral health. They contend that local dental hygienists would be good resources for periodic dental workshops with child care staff.

## Web Watch: Auxiliary Dental Groups

Pages of interest to dentistry.
http://acdaoralhealth.org/
The Alliance of the California Dental Association
http://home.fuse.net/kspradlin/adaainfo.htm
American Dental Assistants Association
http://www.cdha.org/
California Dental Hygienists' Association
http://www.cdla.org/index.html
California Dental Laboratory Association
http://www.dloac.org/
Dental Laboratory Owners Association of California

A listing here does not constitute endorsement by the California Dental Association. As is the case with all web sites, content is subject to frequent change.

CDA JOURNAL, VOL 27, Nº11

# Treating Children in the New Millennium: Current Issues and Future Trends

By Richard D. Udin, DDS

AUTHOR

**Richard D. Udin, DDS,** is the chairman of the Department of Pediatric Dentistry at the University of Southern California School of Dentistry.

As dentistry approaches the new millennium, it is with the hope that our practices are successful and that we continue to receive enjoyment from treating the different patients who utilize our services. For many of us, whether we are general dentists or specialists, a significant number of our patients will include children and adolescents. This population presents many unique challenges that make it timely to explore issues that relate to treating children today and in the future.

Although much has been accomplished in our efforts to reduce dental caries in children, it still remains "a common childhood condition in the United States; the vast majority of children are affected to some degree by the time they reach adulthood."[1] We have learned that in studying the demographics related to dental caries, they are disproportionately skewed toward children with higher risk. Approximately 25 percent of the children have approximately 80 percent of the need.[2] According to Waldman, this population is expected to increase significantly in California by the year 2020.[3]

In critically looking at the current paradigm for preventing dental caries, it becomes apparent that we still need to improve and refine our methods. If we now consider caries to be a transmissible disease and focus our efforts in prevention at a much earlier age (and with a somewhat different armamentarium and philosophy), then perhaps we may better prevent the destruction it causes. The paper, "Newer Approaches to Preventing Dental Caries in

Children," discusses these considerations and offers a somewhat different way of looking at prevention in young children.

The issue of the increasing numbers of children in California is one that will affect the profession – both general practitioners and pediatric dentists. How we are able to accommodate these additional children, many of whom will be from lower income families, will largely depend on our available resources. According to Waldman's projections, we may be facing a relative shortage of pediatric dentists in California in the next 20 years.[3] In dealing with the changing demographics, new strategies will need to be considered. These may include the involvement of more general practitioners who are willing to treat this population, changing the California licensing laws, and/or encouraging the training of more pediatric dentists in the state. These issues have been visited by the California Society of Pediatric Dentists as well as the American Academy of Pediatric Dentistry on the national level. "Workforce Issues in Pediatric Dentistry: Recommendations of a Recent Conference" provides a discussion of these issues and the results of a recently held conference.

Another issue that affects the delivery of dental care to children is one of treating the reluctant or difficult child in the dental office. Many offices utilize oral conscious sedation during the process of performing dentistry on children. For the most part, this is a safe and effective means to facilitate dental care for this population, if provided by a well-trained and "cautious" practitioner. However, following recently reported deaths of children in dental offices and corresponding coverage by the news media, the California Board of Dental Examiners and the state Legislature have introduced changes to the dental practice act (Assembly Bill 2006) that will have a significant effect on our practices beginning Jan. 1, 2000. These changes are intended to better safeguard the well-being of children undergoing oral conscious sedation, whether in a general or specialty office, but will impose stringent requirements on those who continue to offer this service. The article, "Pediatric Oral Conscious Sedation: Changes to Come" is intended to provide information regarding the development of these changes and to outline the new requirements involved in obtaining oral conscious sedation certification.

Also of interest to those who treat children are the many dental materials that have been borrowed or adapted for use on primary teeth from their use on permanent teeth. We have utilized some of these materials for many years, with good clinical success. We've been eager to try some of the newer materials that promise improved handling, esthetics, wear, etc. Sometimes, medicaments that work well in the permanent tooth do not perform as well in the primary tooth, and many of our decisions are based on empirical information. The article, "Effects of Materials Used in Pediatric Dentistry on the Pulp" revisits some of the materials that we used in the treatment of primary teeth and provides a rationale for many of our clinical findings.

Finally, an important consideration in the treatment of children in our practices relates to their vulnerability. Child abuse and neglect are realities in our world, with approximately 3 million cases reported each year. One-third of these cases are eventually substantiated.[4] As mandated reporters, we have a moral and legal obligation to report suspected cases. The number of cases actually reported by dental professionals is small, considering that many of the signs and symptoms can be noted periorally.[5] In an effort to educate the profession, many states have set up coalitions, such as Prevent Abuse and Neglect Through Dental Awareness. "Reporting Child Abuse and Neglect: Responding to a Cry for Help," provides a practical discussion of the mechanics of reporting suspected child abuse and neglect and can be used to help train the dental team.

The material included in this issue of the Journal was chosen both to be clinically relevant and to stimulate discussion. It is hoped that the material will provide the reader with some useful information in treating children today and in the future.

References
1. Vargas CM, Crall JJ, Schneider DA, Sociodemographic distribution of pediatric dental caries: NHANES III, 1998-1994. *J Am Dent Assoc* 129:1229-38, 1998.
2. Kaste LM, Selwitz, et al, Coronal caries in the primary and permanent dentition of children and adolescents 1-17 years of age: United States, 1998-1991. *J Dent* Res 75(Spec Iss):631-41, 1996.
3. Waldman HB, Planning for the children of your current pediatric dental patients. ASDC *J Dent* Child 62:418-25, 1995.
4. National Child Abuse and Neglect Statistical Fact Sheet. National clearinghouse on Child Abuse and Neglect Information. Washington DC, July, 1999.
5. Ramos-Gomez F, Rothman D, Blain S, Knowledge and attitudes among California dental care providers regarding child abuse and neglect. *J Am Dent Assoc* 129:340-8, 1998.

CDA JOURNAL, VOL 27, Nº11

# Newer Approaches to Preventing Dental Caries in Children

By Richard D. Udin, DDS

**ABSTRACT** Although the incidence of dental caries has shown a general decline during the past few decades, it still remains a significant health problem in children. The role of mutans streptococci in the caries process is discussed, including its transmission from mother to child during a discrete "window of infectivity." Anticipatory guidance – an approach used to better intercept the caries process to prevent it from progressing – is discussed. This program is introduced during infancy and is adapted to the child's particular needs as he or she matures. Anticipatory guidance allows for the implementation of some newer preventive strategies.

Following the determination of mutans streptococci levels in at-risk infants and their mothers, a prevention program can be provided to both. Through proper education, various forms of topical fluoride supplementation, and antimicrobial therapy, it is hoped that newer preventive strategies can more effectively reduce the threat of caries at a much younger age than previously possible.

AUTHOR

**Richard D. Udin, DDS,** is the chairman of the Department of Pediatric Dentistry at the University of Southern California School of Dentistry.

Despite progress made during the past 20 to 30 years, dental caries remains a significant health problem affecting infants and children. It accounts for significant discomfort, lost time from school, and visits to the emergency room. In assessing the current methods for preventing and treating dental caries in children, one may wonder whether dentists truly utilize a preventive model; or if, perhaps, they should approach the problem differently. This paper is an attempt to present some of the newer philosophies regarding the process of dental caries in children and provide a glimpse of where dentistry may be headed with prevention strategies.

Recent epidemiologic studies have demonstrated that the caries rate has shown an overall decline during the past two to three decades. Data from previously published studies was summarized in a 1996 paper by Brown, Kaste, and Selwitz.1 From 1971 to 1974, 26 percent of children from 5 to 17 years old were found to have caries-free permanent teeth, with a mean DMFS of 7.1 surfaces in children having cavities. From 1988 to 1991, the percentage of children with caries-free permanent teeth increased to 54.7 percent, with a corresponding decrease in the mean DMFS to 2.5 surfaces in children with cavities.

In a similar study conducted by the National Institute of Dental Research in 1986-1987, 49.9 percent of the children examined had no decay found in their permanent teeth.2 Caution needs to be exercised in interpreting the above

CDA JOURNAL, VOL 27, Nº11

data, and a different picture emerges when the numbers are further analyzed. An excellent discussion related to interpreting this data can be found in a paper by Edelstein and Douglass.[3] The 50 percent figure reported represents an average of children who had a caries-free permanent dentition from the ages of 5 to 17 years. In actuality, 97.3 percent of 5-year-olds and 15.6 percent of 17-year-olds were caries-free. It should not be surprising that less than 3 percent of 5-year-olds display decay in newly erupted permanent molars. Turning the 15.6 percent value around, 84.4 percent of 17-year-olds were found to have dental caries, affecting, on the average, eight or more tooth surfaces.[3] This is a significant number.

An interesting finding was that caries activity in children is unequally distributed, with approximately 25 percent of children and adolescents from age 5 to 17 having 80 percent of the caries found in permanent teeth.[4] Vargas, Crall, and Schneider[5] found that African-American and Mexican-American children had approximately twice the incidence of caries and higher levels of untreated carious lesions than Caucasian children. In addition, lower-income children were found to have a higher caries rate and more unmet dental treatment needs than higher income populations. In fact, according to population projections, these segments of the population are expected to increase during the next six decades.[6] California is expected to have an increase of 3.2 million children and will have the largest Caucasian, Asian-American, and Hispanic populations by the year 2020.[7]

These data have addressed dental caries involving the permanent dentition. Is dentistry doing any better in preventing disease when dentists direct their energies to treating children in the primary and early mixed dentition stages of development? As reported by Edelstein and Douglass,[3] the 1986-1987 NIDR findings regarding dental caries in primary teeth were that mean dfs was found to be 3.4 at age 5, increasing to 3.9 by age 9. If the average 3-year-old has three carious primary tooth surfaces and the average 9-year-old has four carious primary tooth surfaces, it is obvious that preventive efforts need to be directed toward children at a much younger age.

When examining the epidemiology of dental caries affecting primary teeth, the reader must again be cognizant of the uneven distribution noted above. Many of the studies involving preschool children come from examining Head Start program populations, which are made up of lower-income children, age 3 to 5. In summarizing the data, Edelstein and Douglass reported that from 16 percent to 65 percent of the preschool children enrolled in Head Start programs require dental treatment.[3] According to Vargas, Crall, and Schneider,5 in 2- to 5-year-old children at or below 100 percent of the federal poverty line, almost 80 percent of decayed primary teeth have not been restored. So not only is there significant caries in this population, but there is also an issue of access to dental care.

A significant number of preschool children are already found to have dental caries by the age of 2 to 5. A reasonable question to ask at this time is: How early might caries activity develop in children? This becomes an important question for prevention.

For the answer to this question, one needs to revisit a pattern of dental caries affecting infants and toddlers that has previously been called either baby bottle tooth decay or nursing decay. At a 1994 workshop sponsored by the Centers for Disease Control and Prevention, the term early childhood caries was introduced to describe dental caries that begin on the primary incisors prior to age 36 months.8 The problem affects infants and preschoolers who were exposed to improper feeding practices involving baby bottles or breast-feeding. Two excellent reviews by Ripa 9 and Milnes10 summarize previous epidemiologic studies regarding the incidence of early childhood caries. In the United States, the prevalence of early childhood caries ranged from 1 percent in a population of Los Angeles children to 72 percent of Navajo and 55 percent of Cherokee children examined in Head Start centers. The great variability in these findings can be attributed to different criteria used for diagnosis, the conditions under which the examinations were completed, and differences in the populations examined.

Treatment of early childhood caries can be expensive, often requiring extensive restorative treatment and extraction of teeth at a very early age. The cost of the restorative treatment was found to range from $170 to $2,212 by Ramos-Gomez and colleagues.[11] In addition to these costs, general anesthesia may add another $1,000 to $6,000 if the child needs to be hospitalized.[12]

## Mutans Streptocci

It has been known for some time that early childhood caries is an infectious and transmissible disease primarily related to the presence of cariogenic bacteria known as mutans streptococci (MS).[13] Mutans streptococci are only present in the mouth of infants following the eruption of teeth or when there is a nonshedding surface in the mouth, such as an acrylic obturator.[14] MS cannot colonize within the mouth without hard surfaces. The infant acquires MS from his or her mother through frequent and intimate contact.

Interestingly, Li and Caufield[15] found that the genotypes of the MS identified in the infants studied were identical to those found in their mothers an average of 71 percent of the time. In female infants, this specificity increased to 88 percent as opposed to 53 percent found between male infants and their mothers. In no instance was there a match between the infant's strains and their fathers', nor between the fathers' and their spouses'. According to Slavkin,[16] one reason for this similarity between the MS found in mothers and their infants might relate to the transfer of maternal immunoglobulins via the placenta and breast milk and corresponding transmission of the mother's immune specificity. The "exogenous" bacteria of the father would thus be excluded from colonizing the infant's mouth, while selecting for the mother's "indigenous" organisms.

Maternal levels of MS relate to the ability to transmit the organism to the infant. Children whose mothers had low concentrations of salivary MS rarely harbored these microorganisms. Conversely, children whose mothers exhibited high salivary levels tended to have significant infection, according to Berkowitz.[14] MS usually constitutes less than 1 percent of the plaque flora in children with negligible caries activity but exceeds 50 percent of the total cultivable plaque flora in children with nursing caries. The frequency of infant infection was found to be approximately nine times greater when maternal salivary levels of MS exceeded 105 colony forming units (CFU) per ml as compared to maternal salivary MS levels of 103 CFU per ml.[14]

This explains where the infant acquires MS. A more interesting story is when the bacteria are transmitted to the infant. The initial colonization of MS occurs during a discrete period of time, or "window of infectivity," occurring between 19 and 31 months, with a median age of 26 months.[17] This timing corresponds with the eruption of the first and second primary molars, which provide a large surface area as well as grooved and fissured surfaces for colonization.[18] Other studies, however, point to an earlier window for MS colonization, occurring before 12 months of age, coinciding with eruption of the incisors.[19] After the window closes at 31 to 33 months, there essentially are no new tooth surfaces to become colonized in the mouth, so MS would have trouble becoming established. There is speculation that a second window occurs at the time of eruption of the first permanent molars and incisors at age six, but this has yet to be determined.[18]

Mutans streptococci is only one group of many organisms found in the mouth. More than 400 species can be found in adults, each in its own niche.[16] There is an ecological succession of organisms that begins shortly after birth and continues into adulthood. For example, S. sanguis colonizes the mouth of infants from approximately 9 to 12 months of age. It competes with and influences the later colonization of MS during its window of infectivity. Dasanayake and colleagues20 hypothesized that by giving the younger child antibiotics, the environment becomes more favorable for MS colonization due to its affect on S. Sanguis.

Dental caries is considered a multifactoral process, involving other variables in addition to pathogenic microorganisms. One such piece of the puzzle is the "substrate" to which the child is exposed. Oral bacteria thrive in an environment rich in carbohydrates. Whether the infant goes to bed with a bottle of formula or juice or frequently snacks on cariogenic foods, the frequent and prolonged consumption of foods known to lower plaque pH is very important. Such a diet can greatly facilitate an increase in the population of MS, which can lead to a high risk for rampant decay.[13]

What parents place in the infant's bottle does have some significance in determining the cariogenic potential of the solution. Sheikh and Erikson[21] studied eight different infant formulas and found that they all were capable of significantly reducing plaque pH. The cariogenic potential of bovine milk has recently come under question. A review by Seow[13] indicated that bovine milk, by itself, may not be cariogenic. In a recent study by Erickson and Mazhari,[22] human breast milk, although it supported bacterial growth and was not a good buffer, also did not appear to be cariogenic. More studies are necessary to definitively establish the cariogenicity of these fluids.

Parents also place other liquids in baby bottles. Siener and colleagues23 interviewed women in three California counties regarding feeding practices of their infants. Fifty-three percent owned baby bottles having popular soft drink, juice, or Kool-Aid logos. Thirty-one percent of the children were actually given Kool-Aid or soda to drink from these bottles. The parents most likely to establish this practice were younger, poorly educated individuals from lower socioeconomic groups.

There is another variable in the equation – the susceptible host. How can dentists make the dentition of the host or young child less susceptible to attack? In trying to prevent the process of early childhood caries from occurring in the infant, it would appear that there are two avenues that can be taken. The first intervention would be to work toward preventing damage caused by bacteria from occurring to the

child's healthy mouth by controlling the substrate and providing aggressive oral hygiene measures (primary prevention). The second intervention would be to educate and treat the mother to attempt to prevent or minimize the spread of infection to her infant (primary-primary prevention).[24] These goals are not mutually exclusive and form the basis of some newer approaches to prevention that are dependent on early identification and intervention prior to the birth of the child or while the child is young enough so that disease can truly be prevented.

## Prevention

The current practice of physicians providing intraoral prevention and care as a part of routine well-baby visits and deferring the child's first visit to the dentist until age 3 to 4 is not optimally effective in preventing dental caries. Many physicians are not adequately prepared to deal with issues related to oral health. In a study by Sanchez and colleagues,[25] pediatricians and family physicians practicing in Alabama were surveyed and were generally found to understand the importance of oral health. However, most physicians received two hours or less of education in preventive dentistry during their medical and/or specialty training and indicated on the survey the need to increase their knowledge in this area.

With the initial dental visit being so late, the child in many cases is seen by the dentist after the caries process has begun. This approach is based on the traditional view that caries are inevitable. The responsibility of the dentist was to repair the damage caused by the disease and then institute prevention.[26] This approach is not truly preventive and does not catch the process at an early enough time to be effective. Since the process of early childhood caries begins much earlier than 3 to 4 years of age, to more optimally prevent the disease, a strategy that includes earlier intervention must be initiated.

That is the rationale of the American Academy of Pediatric Dentistry in recommending that infants receive their initial professional evaluation by a dentist by approximately 12 months of age or shortly after the primary teeth begin to erupt.[27] It is hoped that by scheduling the initial appointment at an early age and providing counseling and intervention to parents, early childhood caries and other potential problems can be anticipated and prevented. In fact, the phrase, "anticipatory guidance" was borrowed from pediatricians, who have adopted this concept as part of well-child care visits. According to Nowak and Casamassimo,[28] anticipatory guidance is the "process of providing practical, developmentally appropriate health information about children to their parents in anticipation of significant physical, emotional, and psychological milestones. This information guides parents by alerting them to impending changes, teaching them their role in maximizing their children's developmental potential and identifying their children's special needs." It is a proactive counseling process in which parents are questioned about their child's level of dental development ("dental developmental milestones"), and risk assessment is used to identify areas in which education or intervention are needed.

**TABLE 1**

**Milestones Associated With Different Age Groups[28]**

| Age | Milestone |
|---|---|
| 6-12 months | Eruption of first primary teeth |
| 12-24 months | Completion of primary dentition, occlusal relationship and arch length determined |
| 2-6 years | Loss of primary incisors, eruption of first permanent molars and incisors |
| 6-12 years | Mixed dentition established, eruption of permanent canines and premolars |
| 12-18 years | Loss of remaining primary teeth, eruption of second permanent molars |

Preventive measures for the child would change as the child gets older and his or her needs change. For example, oral hygiene for the infant must be carried out by the parents while the 10-year-old should be able to take responsibility for his or her own care. Fluoride requirements would change with age and circumstance. Sealants would be discussed at the time that susceptible molars erupt. Use of a mouthguard would be encouraged when the child participates in contact sports. The process of anticipatory guidance would begin with the earliest visit to the dentist and would continue as the child matures, changing in anticipation of each child's needs at each point in time.

For the purpose of discussion, a child's developmental age range can be divided into different stages and particular developmental milestones can be associated with each period. The first period would be from 6 to 12 months of age. This corresponds to the eruption of the first teeth into the oral cavity. The second period would be from 12 to 24 months, during which the primary dentition is completed. The third period would be from 2 to 6 years. During this period, the child would experience the loss of the first primary teeth and the eruption of the permanent molars and/or incisors. From 6 to 12 years, the child would be in the mixed dentition stage of development. He or she would experience losing the remaining primary molars and canines with the eruption of the

corresponding succedaneous canines and premolars. The anticipatory guidance process can extend into the adolescent period, from 12 to 18 years of age and beyond, into adulthood (**Table 1**). During every period of development, there are issues that need to be addressed. The dental professional is in an ideal position to anticipate the potential problems that may occur during each developmental period and provide the patient or his or her parents with the information necessary to prevent or mitigate any potential problems. Each time the infant or young child is examined by the dentist, the anticipatory guidance process may be utilized to address any risk factors related to the following components: the child's health history, diet and nutrition status, fluoride adequacy, oral habits, injury prevention, oral development, and oral hygiene (**Table 2**).

At the initial examination of a 6- to 12-month-old having discoloration of the erupting primary teeth, questions related to the health history might be relevant for problems occurring during pregnancy that could affect the development of the primary teeth. Diet and nutrition questions would determine whether the baby uses a bottle at bedtime or engages in on-demand breast-feeding. Does the child drink from a cup? A discussion of injury prevention would include a discussion of using car seats and making the home child-proof for the toddler. A discussion of oral development would prepare the parent for the pattern and timing of tooth eruption and problems related to teething. A discussion of oral hygiene would be important at this time to educate the parent in brushing the teeth as soon as they erupt and to use a smear or pea-sized amount of fluoridated toothpaste (with the ADA Seal of Acceptance).

**TABLE 2**

**Common Risk Factors Addressed as Part of Anticipatory Guidance[27,28]**

| | Risk Factors |
|---|---|
| Health history | Problems during pregnancy Complications at birth Infant/childhood illnesses |
| Diet and nutrition | Breast/bottle feeding Weaning to cup |
| Role of carbohydrates Balanced diet Snacking | |
| Fluoride adequacy | Analysis of drinking water use of Dentifrice Fluoride supplementation Prevention of Fluorosis |
| Oral habits | Finger/pacifier sucking Bruxism |
| Injury prevention | Childproofing the home use of car seats Managing oral trauma Use of mouthguards |
| Oral development | Eruption sequence/timing Enamel quality Teething Occlusal surface morphology/ Caries susceptibility Oral problems/malocclusion |
| Oral hygiene | Toothbrushing/flossing Timing of dental visits Mutans streptococci testing |

For the 12- to 24-month-old, the process of anticipatory guidance might focus in the area of diet and nutrition. The child should be weaned from the bottle or breast, and the parent should be aware of the role of carbohydrates in the caries process. Fluoride adequacy should be established to ensure maximum protection. Oral hygiene would be critical at this point, considering the role of MS in the caries process and the window of infectivity during which it colonizes the child's mouth. Making sure that the child and his or her mother both attain optimal levels of oral hygiene is important during this critical time. Determining the MS levels in both the mother and child would be of great benefit in assessing the risk of developing early childhood caries. When dentists begin to adopt these strategies, they are adopting a more microbiologic approach to dental caries. When they can begin to anticipate that this period is critical to the early colonization of MS and the risk of developing early childhood caries, they may be able to prevent the process from occurring. By treating the child at this early age, the dentist has begun the process of prevention two to three years earlier than it is traditionally done.

For the 2- to 6-year-old, discussion of oral habits might be relevant. A child that sucks on a finger when he or she is in the mixed dentition stage requires a different intervention than a toddler with the same habit. Oral development can be revisited at this time to explain the pattern and timing of eruption of the permanent teeth to the parent. Oral hygiene is again discussed as the child should take greater responsibility in his or her home care, and flossing should be instituted as the interproximal contacts close.

For the 6- to 12-year-old child, injury prevention is an important area to discuss. At this age, many children are active in organized sports, and some sports-related injuries can be prevented through the use of a mouthguard. Oral development would be important to discuss during this period. Permanent molars are erupting, and the benefits of pit and fissure sealants should be presented. Also, issues related to early tooth loss, space maintenance, and treatment of problems in occlusal development should be discussed.

The process of anticipatory guidance continues throughout the different age ranges and stages of development and can be extended into adulthood. The

adult patient may be counseled regarding anticipated problems that may develop affecting the dentition and periodontium related to advancing age.

As has been discussed, through anticipatory guidance, potential problems may be anticipated and parents and patients educated. The next step in crafting an optimal prevention program is to identify appropriate interventions that can be utilized in addressing these potential problems.

## Fluoride

An obvious place to start a preventive program would be with fluoride. Water fluoridation continues to be a very effective, cost-efficient, and safe public health method for preventing dental caries in children.[29] In the 1986-87 NIDR study previously discussed, Waldman noted that children raised in communities having optimal water fluoridation were found to have DMFS scores approximately 18 percent below those of children without water fluoridation. This protection was noted to be most effective on smooth tooth surfaces.[30] Many communities in California have not had the benefits of fluoridated water, although recent legislation could change this situation. In October 1995, the Statewide Fluoridation Bill (AB733) was signed into law. The bill allows for the fluoridation of water systems in California with 10,000 or more service connections (serving approximately 25,000 or more residents). Funding comes from government grants, foundations, and other sources.[31] It is now believed that a low-dose, high-frequency topical application of fluoride is the main mechanism for preventing caries, whether it is provided through water fluoridation, fluoride rinses, chewable tablets, or dissolvable lozenges. Water fluoridation provides a topical benefit to the teeth several times a day, whenever water, or foods or juices prepared with fluoridated water, come in contact with the teeth.[29,32] According to Featherstone,[33] the level of fluoride provided from drinking water serves to inhibit demineralization and enhance remineralization of teeth.

Since, for the present, many communities in California do not have water fluoridation available, other methods of delivering fluoride topically to the teeth need to be considered.

Toothpaste containing fluoride, when used consistently, is an effective method for reducing the incidence of caries.[34] Most toothpastes available in the United States contain from 1,000 to 1,100 ppm of fluoride. After a person brushes and rinses, fluoride levels in their saliva rapidly decline. However, some fluoride "deposits" form on the soft tissues and provide additional fluoride as they gradually deplete.[29] By the time they reach 18 to 24 months of age, most children have their teeth brushed with a fluoride-containing dentifrice.[35] In light of the "window of infectivity" related to the colonization of the mouth by MS, to be effective, toothbrushing must be instituted at a much earlier age. How well parents are doing in brushing their infants' teeth comes from a study by Levy and colleagues36 in which the authors found that approximately 12.9 percent of 6-month-olds, 36.7 percent of 9-month-olds and 64.5 percent of 12-month-olds had their teeth brushed, primarily by the mother. Among parents who used dentifrice, 94 to 97 percent used fluoridated dentifrice, with approximately 0.25 g of toothpaste or less (0.25 mg of fluoride) placed on the brush. The amount of toothpaste needed to form 0.25 g would be considered to be pea-sized, which is the amount currently recommended by the American Dental Association and the American Academy of Pediatric Dentistry.[37]

Children younger than 6 swallow a large percentage of the toothpaste placed on the toothbrush, causing much of the toothpaste to be absorbed in the gastrointestinal tract.[38] The significance of swallowing toothpaste is important for the child who already is exposed to additional sources of fluoride in the diet and/or via supplements. The Fluoride Supplement Schedule, which was modified by the American Dental Association in 1995, serves as a guide to the amount of supplemental fluoride that a child should receive, related to age and amount of fluoride in the water system (**Table 3**).[39] If a 12-month-old child is having his or her teeth brushed twice daily, resides in a community with optimal fluoride in the water and is receiving additional supplementation, the child could be receiving well more than the recommended 0.25mg/day fluoride. Pendrys[38] studied the causes of fluorosis in a sample of teenagers from an optimally fluoridated community. The author found that 71 percent of the fluorosis cases were related to a history of exceeding the recommendation for the amount of toothpaste placed on the toothbrush. Inappropriate fluoride supplementation accounted for 25 percent of the cases of fluorosis.

Although providing adequate amounts of fluoride is an important

**TABLE 3**

**Daily Dietary Fluoride Supplementation Schedule[37]**

| Age | Less than 0.3 ppm F- | More than 0.3-0.6 ppm F- | 0.6 ppm F- |
|---|---|---|---|
| 0-6 months | 0 | 0 | 0 |
| 6 months – 3 years | 0.25 mg | 0 | 0 |
| 3-6 years | 0.50 mg | 0.25 mg | 0 |
| 6-16 years | 1.00 mg | 0.50 mg | 0 |

preventive measure, there is a danger in overprescribing fluoride supplements. Another source of fluoride for infants comes from commercially available infants foods and dry cereals. Heilman and colleagues[40] found that fluoride concentrations ranged from 0.01 to 8.38 micrograms of fluoride per gram. Dry infant cereals reconstituted with fluoridated water and infant foods containing chicken both could provide significant amounts of fluoride to the infant.

Fluoride varnish has been used in Europe with generally favorable results and has recently been introduced into the United States as Duraflor, a 5 percent neutral sodium fluoride varnish. In a review of previous studies, DeBruyn and Arends[41] cited a caries reduction rate in the permanent dentition of from 18 to 56 percent. Effectiveness in the primary dentition, however, has been inconclusive. Studies are being conducted in the United States that will provide more information on whether this technique should be routinely incorporated into an early preventive program.

Although fluoride is able to significantly reduce decay involving smooth tooth surfaces, it is least effective in preventing occlusal surface decay. In fact, 84 percent of caries in 5- to 17-year-olds involves the occlusal pits and fissures.3 Dental sealants are a very effective technique for preventing pit and fissure decay, with five-year retention rates of from 67 to 87 percent.[42] There is evidence that placement of the sealant is itself responsible for causing a reduction in MS levels on the treated occlusal surfaces.[43] Despite its effectiveness, only about 19 percent of children age 5 to 17 had sealants placed on permanent teeth, with only 1.4 percent of children from 2 to 11 having any sealants placed on primary teeth.[1]

One area showing promise comes from incorporating a fluoride-release mechanism into pit and fissure sealants. Not only would the occlusal surfaces of permanent and primary molars benefit from sealing of the pits and fissures, but fluoride has also been shown to reduce enamel demineralization on areas adjacent to the sealant.[44-46] The addition of fluoride does not seem to decrease the retentiveness of the sealant; however, much of the fluoride release may be of only short duration.[47] There is evidence that when fluoride-depleted restorations are subjected to a four-minute topical acidulated phosphate fluoride treatment, as is routinely done on a semiannual basis in most dental offices, the restorations again release significant amounts of fluoride, after being "recharged."[48,49]

As was previously discussed, the traditional methods currently in use have not been very effective in preventing early childhood caries in very young children. Delivering preventive services to the children with the highest risk for developing dental caries is often difficult. For children from lower socioeconomic environments, a more community-based or school-based model may be appropriate for delivery of early preventive and interceptive services. Anticipatory guidance programs, parent education, brushing or rinsing programs with fluoride supplements, and/or application of fluoride varnish are some of the services that could be provided from a public health perspective.[50] Educational programs that have been directed toward pregnant women or new parents have been found to be somewhat effective.[12] Ripa 9 reviewed some of these programs and recommended that they be made an essential part of preventive programs targeting high-risk groups.

By considering early childhood caries to be an infectious disease, additional preventive strategies become available. This will most likely become a more significant factor in future prevention strategies. Dentists now have the ability to determine the intraoral MS levels in children and their mothers. This, in turn, allows the provision of various microbiologically based interventions for the at-risk child and his or her mother, thus influencing the level and timing of MS colonization. In a recent study by Lopez and colleagues,[51] infants at high risk for developing early childhood caries (12 to 19 months of age) had either 10 percent povidone iodine or placebo applied to their teeth every two months during an average of about seven months. The authors found that placement of the antimicrobial solution over the teeth significantly reduced the incidence of early childhood caries. In a study of older children, age 8 to 10 years, either a chlorhexidine varnish or gel was applied to the teeth or patients brushed daily with chlorhexidine toothpaste. All regimens were capable of reducing salivary MS levels; however, the authors noted that the interdental MS colonization was relatively unaffected by the intervention.[52]

Luoma and colleagues[53] studied the effects of daily rinsing with a solution of chlorhexidine and sodium fluoride in 11- to 15-year-old schoolchildren. After two years, both the caries rate and level of gingivitis were reduced compared with the other groups studied. In another use of chlorhexidine, 4- to 12-year-olds using a nightly chlorhexidine varnish-filled mouthguard for one week were reported to have significantly reduced MS levels over a three-month period.[54] There is a need for more clinical study of povidone iodine, chlorhexidine, and other antimicrobial agents before antimicrobial treatment can be routinely

prescribed for children, especially infants and preschoolers. It is uncertain whether chlorhexidine represents a viable antimicrobial to use in children to prophylactically limit the MS population. It appears, however, that short-term chlorhexidine regimens do not select for resistant MS species.[55]

According to Gunay and colleagues,[24] the prevention of dental decay in the healthy mouth of a young child is termed "primary prevention." To take prevention of early childhood caries a step further, "primary-primary prevention" begins even earlier and targets pregnant women. Mothers-to-be were taught how to care for their own mouths and provided with dietary counseling, professional prophylaxis, necessary restorative treatment, topical fluoride varnish application, and chlorhexidine mouthrinsing. They were also taught how to provide oral hygiene care for their baby, given instruction in proper infant dietary habits, and the abovementioned preventive services were phased in as the baby matured.[24] After following the babies for up to four years, the authors found statistically significant differences from a control group of children.

Targeting pregnant mothers in an effort to prevent early childhood caries in their children appears to be a promising strategy. Brambilla and colleagues56 provided pregnant women with daily chlorhexidine rinses during the last six months of their pregnancy and every six months for the next two years. This intervention significantly reduced salivary MS levels in the mothers and delayed colonization of MS in their children. Similar findings were noted by Tenovuo and colleagues[57] and by Kohler and colleagues[58] when prevention programs targeted mothers of infants, prior to colonization of MS in the child.

## Conclusion

There is a new paradigm for looking at the caries process in children. Caries is a transmissible process from the mother to the infant, and MS colonizes the mouth of the infant during a discrete "window of infectivity." This information provides dentists with the basis for designing a prevention program that approaches the caries process at an earlier age and in a more microbiologic manner. By incorporating the procedures of anticipatory guidance into their armamentarium, dentists can identify infants at high risk for developing early childhood caries. Through preventive techniques aimed at the mother-infant pair, the caries process can truly be prevented. Some of the modalities to prevent the process are currently available. More study is needed prior to recommending the routine use of antimicrobials in children at this time, although these techniques will likely prove to be effective when the proper agents are selected.

References

1. Brown LJ, Kaste LM, et al, Dental caries and sealant usage in U.S. children, 1988-1991. Selected findings from the third National Health and Nutrition Examination Survey. *J Am Dent Assoc* 127:335-43, 1996.
2. Johnson S, Dental caries continues downward trend in children. *J Am Dent Assoc* 117:625, 1988.
3. Edelstein BL, Douglas CW, Dispelling the myth that 50 percent of U.S. schoolchildren have never had a cavity. Public Health Reports 110:522-33, 1995.
4. Kaste LM, Selwitz RJ, et al, Coronal caries in the primary and permanent dentition of children and adolescents 1-17 years of age: United States, 1988-1991. *J Dent* Res 75:Spec Iss:631-41, 1996.
5. Vargas CM, Crall JJ, et al, sociodemographic distribution of pediatric dental caries: NHANES III, 1988-1994. *J Am Dent Assoc* 129:1229-38, 1998.
6. Waldman HB, More minority children and the need to stress dental care. *J Dent* Child 60:403-7, 1993.
7. Waldman HB, Planning for the children of your current pediatric dental patients. ASDC *J Dent* Child 62:418-25, 1995.
8. Al-Shalan TA, Erickson PR, Hardie NA, Primary incisor decay before age 4 as a risk factor for future dental caries. *Pediatr Dent* 19:37-41, 1997.
9. Ripa LW, Nursing caries: a comprehensive review. *Pediatr Dent* 10:268-82, 1988.
10. Milnes AR, description and epidemiology of nursing caries. J Public Health Dent 56:38-50, 1996.
11. Ramos-Gomez FJ, Huang G, et al, Prevalence and treatment costs of infant caries in Northern California. ASDC *J Dent* Child 63:108-12, 1996.
12. Tinanoff N, O'Sullivan DM, Early childhood caries: overview and recent findings. *Pediatr Dent* 19:12-6, 1997.
13. Seow WK, Biological mechanisms of early childhood caries. Community Dent Oral Epidemiol 26(Suppl 1):8-27, 1998.
14. Berkowitz R, Etiology of nursing caries: a microbiologic perspective. J Public Health Dent 56:51-4, 1996.
15. Li Y, Caufield PW, The fidelity of initial acquisition of mutans streptococci by infants from their mothers. *J Dent* Res 74:681-5, 1995.
16. Slavkin HC, First encounters: transmission of infectious oral diseases from mother to child. *J Am Dent Assoc* 128:773-8, 1997.
17. Caufield PW, Cutter GR, Dasanayake AP, Initial acquisition of mutans streptococci by infants: evidence for a discrete window of infectivity. *J Dent* Res 72:37-45, 1993.
18. Caufield PW, Dental caries -- a transmissible and infectious disease revisited: a position paper. *Pediatr Dent* 19:491-502, 1997.
19. Mohan A, Morse DE, et al, The relationship between bottle usage/content, age, and number of teeth with mutans streptococci colonization in 6-24-month-old children. Community Dent Oral Epidemiol 26:12-20, 1998.
20. Dasanayake AP, Roseman JM, et al, Distribution and determinants of mutans streptococci among African-American children and association with selected variables. *Pediatr Dent* 17:192-8, 1995.
21. Sheikh C, Erickson OR, Evaluation of plaque pH changes following oral rinse with eight infant formulas. *Pediatr Dent* 18:200-4, 1996.
22. Erickson PR, Mazhari E, Investigation of the role of human breast milk in caries development. *Pediatr Dent* 21:86-90, 1999.
23. Siener K, Rothman D, Farrar J, Soft drink logos on baby bottles: Do they influence what is fed to children? ASDC *J Dent* Child 64:55-60, 1997.
24. Gunay H, Dmoch-Bockhorn K, et al, Effect on caries experience of a long-term preventive program for mothers and children starting during pregnancy. Clin Oral Invest 2:137-42, 1998.
25. Sanchez OM, Childers NK, et al, Physicians' views on pediatric preventive dental care. *Pediatr Dent* 19:337-83, 1997.
26. Nowak AJ, Rationale for the timing of the first oral evaluation. *Pediatr Dent* 19:8-11, 1997.
27. American Academy of Pediatric Dentistry Reference Manual, Infant oral health care guidelines. *Pediatr Dent* 20:72-4, 1998
28. Nowak AJ, Casamassimo PS, Using anticipatory guidance to provide early dental intervention. *J Am Dent Assoc* 126:1156-63, 1995.
29. Limeback H, Toward a caries-free society -- Fluoride therapies for today and the next century. *J Can Dent Assoc* 61:601-5, 1995.
30. Waldman HB, Oral health status of women and children in the United States. J Pub Health Dent 50( Special Iss):379-89, 1990.
31. Belshe D, The time to fluoridate is now. California

Fluoridation Now 1:1-2, 1998.
32. Ismail AI, Prevention of early childhood caries. Comm Dent Oral Epidemiol 26(Suppl 1):49-61, 1998.
33. Featherstone JDB, Prevention and reversal of dental caries: role of low level fluoride. Comm Dent & Oral Epidemiol 27:31-40, 1999.
34. Winston AE, Bhaskar SN, Caries prevention in the 21st century. *J Am Dent Assoc* 129:1579-87, 1998.
35. Levy SM, A review of fluoride intake from fluoride dentifrice. ASDC *J Dent* Child 60:115-24, 1993.
36. Levy SM, Kiritsy MC, et al, Patterns of fluoride dentifrice use among infants. *Pediatr Dent* 19:50-5, 1997.
37. American Academy of Pediatric Dentistry Reference Manual, Fluoride guidelines. *Pediatr Dent* 20:26-7, 1998.
38. Pendrys DG, Risk of fluorosis in a fluoridated population. Implications for the dentist and hygienist. *J Am Dent Assoc* 126:1617-24, 1995.
39. American Dental Association Council on Access, Prevention and Interprofessional Relations, Caries diagnosis and risk assessment. *J Am Dent Assoc* 126 (special suppl), 1995.
40. Heilman JR, Diritsy MC, et al, Fluoride concentrations of infant foods. *J Am Dent Assoc* 128:857-63, 1997.
41. DeBruyn H, Arends J, Fluoride varnishes -- A review. J Biol Buccale 15:71-82, 1987.
42. ADA Council on Access, Prevention and Interprofessional Relations; ADA Council on Scientific Affairs, Dental sealants. *J Am Dent Assoc* 128:485-8, 1997.
43. Mass E, Eli I, et al, Continuous effect of pit and fissure sealing on S. mutans presence in situ. *Pediatr Dent* 21:164-8, 1999.
44. Jensen ME, Wefel JS, et al, Effects of a fluoride-releasing fissure sealant on artificial enamel caries. Am *J Dent* 3:75-8, 1990.
45. Hicks MJ, Flaitz CM, Caries-like lesion formation around fluoride-releasing sealant and glass ionomer. Am *J Dent* 5:329-34, 1992.
46. Hicks MJ, Flaitz CM, Caries formation in vitro around a fluoride-releasing pit and fissure sealant in primary teeth. ASDC *J Dent* Child 65:161-8, 1998.
47. Jensen OD, Billings RJ, Featherstone JDB, Clinical evaluation of Fluoroshield pit and fissure sealant. Clinical Prevent Dent 12:24-7, 1990.
48. Kupietzky A, Houpt M, et al, fluoride exchange from glass ionomer preventive resin restorations. *Pediatr Dent* 16:340-5, 1994.
49. Steinmetz MJ, Prugs RJ, et al, Rechargeability of fluoride releasing pit and fissure sealants and restorative resin composites. Am *J Dent* 10:36-40, 1997.
50. Weinstein P, Public health issues in early childhood caries. Community Dent Oral Epidemiol 26(Suppl 1):84-90, 1998.
51. Lopez L, Berkowitz R, et al, Topical antimicrobial therapy in the prevention of early childhood caries. *Pediatr Dent* 21:9-11, 1999.
52. Twetman S, Peterson LG, comparison of the efficacy of three different chlorhexidine preparations in decreasing the levels of mutans streptococci in saliva and interdental plaque. Caries Res 32:113-8, 1997.
53. Luoma H, Murtomaa H, et al, A simultaneous reduction of caries and gingivitis in a group of schoolchildren receiving Chlorhexidine-fluoride applications. Results after 2 years. Caries Res 12:290-8, 1998.
54. Achong RA, Briskie DM, et al, Effect of chlorhexidine varnish mouthguards on the levels of selected oral microorganisms in pediatric patients. *Pediatr Dent* 21:169-75, 1999.
55. Jarvinen H, Pienihakkinen K, et al, susceptibility of Streptococcus mutans and Streptococcus sobrinus to antimicrobial agents after short-term oral chlorhexidine treatments. Eur J Oral Sce 103:32-5, 1995.
56. Brambilla E, Felloni A, et al, Caries prevention during pregnancy: results of a 30-month study. *J Am Dent Assoc* 129:871-7, 1998.
57. Tenovuo J, Hakkinen P, et al, Effects of chlorhexidine-fluoride gel treatments in mothers on the establishment of mutans streptococci in primary teeth and the development of dental caries in children. Caries Res 26:275-80, 1992.
58. Kohler B, Bratthall D, Krasse B, Preventive measures in mothers influence the establishment of the bacterium streptococcus mutans in their infants. Arch Oral Biol 28:225-31, 1983.

To request a printed copy of this article, please contact/ Richard D. Udin, DDS, Department of Pediatric Dentistry, USC School of Dentistry, 925 W. 34th St., Room 4308, Los Angeles, CA 90089.

CDA JOURNAL, VOL 27, Nº11

# Workforce Issues in Pediatric Dentistry: Recommendations of a Recent Conference

Roger G. Sanger, DDS, MSEd, and Paul A. Reggiardo, DDS

**ABSTRACT** A recent conference of the California Society of Pediatric Dentists discussed issues surrounding the shortage of pediatric dentists in the state. Several contributing factors were identified and recommendations made as to ways of working with the dental schools to help increase the number of practitioners. This article frames the problem regarding servicing the state's children and discusses some recommended actions.

AUTHORS

**Roger G. Sanger, DDS, MSEd,** is in private practice in Salinas, Calif. He was board director and conference chairperson (1996-1998) of the California Society of Pediatric Dentists (manpower issues).

**Paul A. Reggiardo, DDS,** is District VI trustee of the American Academy of Pediatric Dentistry and a past president of the California Society of Pediatric Dentists. He is in private practice in Huntington Beach, Calif.

In the early 1990s, it became apparent to many practicing pediatric dentists that the number of new colleagues available for practice associations or practice purchase was insufficient to meet the needs. Likewise, dental school administrators experienced a declining supply of pediatric dental educators to meet their current and future needs. This situation was contrary to that of the 1980s, when there seemed to be no need for concern. At the urging of its membership, the California Society of Pediatric Dentists convened a conference in February 1998 to address the workforce issues in pediatric dentistry. This conference was attended by the leadership of the society, the chairpersons of pediatric dentistry departments, and the program directors of all the advanced education postdoctoral programs in pediatric dentistry in California.

The following material is taken from an oral presentation made at the conference.

## The Issues

Producing the practitioners and educators necessary to meet the oral health needs of California's pediatric population in the near future and well into the next century will require a significant increase in pediatric dental training. Changing pediatric demographics and the unmet needs of a growing population will place severe demands on pediatric dental resources.

In his 1995 alert to the profession, Waldman cited U.S. Bureau of the Census figures projecting an increase of 8.1

CDA JOURNAL, VOL 27, Nº11

**TABLE 1.**

**Distribution of Students Enrolled in Advanced Pediatric Dentistry Programs in California.**

| | First Year | Second Year | Third Year | Female | Out of State | Foreign |
|---|---|---|---|---|---|---|
| LLU | 3 | 3 | 0 | 3 | 0 | 0 |
| UCLA | | | | | | |
| Pediatric dentistry | 3 | 4 | 0 | 8 | 3 | 0 |
| Combined pedo/ ortho program | 2 | 2 | | | | |
| UCSF | 3 | 2 | 2 | 3 | 3 | 0 |
| USC | 6 | 5 | 0 | 8 | 2 | 1* |
| Total | | | | | | |
| * Canada | 17 | 16 | 2 | 22 | 8 | 1* |

million people younger than 15 during the following 25 years.[1,2] Of this increase, 3.2 million were expected to reside in California. While the country as a whole will experience a 14 percent growth in its child population, California's will grow a stunning 43 percent. Two out of every five additional children in this country will be living in California.

According to Waldman's figures comparing Census Bureau data with survey results from the American Dental Association on the numbers, age, and distribution of pediatric dentists in private practice in 1993, there were 5.6 pediatric dentists in California per 100,000 children. To maintain this current 1:18,000 ratio will require a corresponding 43 percent increase in the number of pediatric dentists. This translates to a statewide need for an expanded workforce of 180 more practicing pediatric dentists. These 180 practitioners are in addition to those pediatric dentists needed to replace some of the current 418 active practitioners who will retire or otherwise withdraw from practice during the next 25 years. When projected growth and projected replacement requirements are considered, at least 511 new pediatric dentists will be needed in California by the year 2020. At the current level of training, California will need to be successful in recruiting one out of every five pediatric dental postdoctoral graduates trained in the United States during the next quarter century.

Seeking to validate these workforce needs projections, in 1997, the California Society of Pediatric Dentists surveyed its active membership on practice patterns, retirement plans and demand for services.[3] A 64 percent response rate from the 350 surveys sent to member-practitioners indicated a high interest in workforce issues. Respondents ranged in age from 29 to 76, with an average age of 49 years. Eighty-nine percent reported having ownership interest in their practices, while the remaining 10 percent reported being employees, associates, or independent contractors. In general, pediatric dentists in California reported being busy. Seventy percent of all respondents said they provided patient care at least 32 or more hours a week.

Nearly 30 percent of the practice owners reported that they were currently seeking an associate or partner to increase the number of pediatric dental providers in their offices. Almost 60 percent of the practice owners reported plans to increase the number of pediatric dentists within five years. When these practice owners were asked to estimate the demand for services if an additional provider were available, more than 70 percent responded that they could provide from 2 1/2 to a full five days a week practice opportunity for a new associate.

Plans for retirement among respondents confirmed the need for a significant number of replacement pediatric dentists in the near future. More than 40 percent of practice owners reported planning to reduce the number of hours spent in patient care in the next five years and a majority of practice owners reported similar plans within the next 10 years.

As current practitioners age, reductions in their practice hours will also have a significant impact on availability of patient care since more than 90 percent of them reported plans to reduce their practice time to two to three days a week. Almost 40 percent of practice owners reported having plans for full retirement within 10 years and 20 percent reported having plans to retire from practice within five years, indicating that in each of the next five-year increments, approximately 20 percent of practice principals plan to retire from pediatric dental practice.

As pediatric dentists retire, advanced education postdoctoral programs are not providing adequate numbers for their replacement (**Table 1**). Since 1980, there has been a decrease in the number of postdoctoral programs in the dental schools and teaching hospitals. The number of new pediatric dental graduates has decreased sharply since the late 1970s. Although this trend has reversed somewhat in the past few years, the most recent figures indicate only about 180 pediatric dental graduates each year complete training programs. The American Academy of Pediatric

CDA JOURNAL, VOL 27, Nº11

Dentistry estimates that the number of active pediatric dentists in the country decreased from 3,967 in 1990 to 3,678 in 1997, reducing the available workforce by 7 percent during the past seven years.

Gender changes in pediatric dentistry during the past 20 years have been dramatic as well. In 1980, only 8 percent of the postdoctoral pediatric dental training positions were occupied by women. Today, this population is approximately 60 percent female. While the long-term impact of this gender inversion is not yet measurable, preliminary indications are that the overall productivity of the pediatric dental workforce may decrease.[4]

Furthermore, not every graduate of a postdoctoral pediatric dental program in the United States is available to meet U.S. needs. Only about 70 percent of these students are U.S. citizens. Many are foreign-trained graduates who return to their countries of origin.

The conference identified six specific factors that have contributed to the workforce crisis in pediatric dentistry in California.

### *Age*

The majority of private practicing and/or academic pediatric dentists in California are middle aged and older. Many have impending plans to reduce their work effort.

### Number of Programs

Four of the five California Dental Schools (Loma Linda University, the University of California at Los Angles and San Francisco, and the University of Southern California) have postdoctoral training programs. None have dramatically increased their graduate student numbers. Most graduate students are women. Some are residents of other states or foreign countries (**Table 1**).

### Gender

The majority of new pediatric dentists are women. Many have a desire to have a reduced work effort in private practice and/or academic pediatric dentistry as they start or maintain a family.

### Geography

The majority of pediatric dentists are still concentrated in the larger metropolitan areas of California, especially in Southern California.

### Practice

The majority of practicing pediatric dentists have a traditional fee-for-service practice. Very few are involved in managed care programs and/or indigent care programs. As these programs increase, the shortage of pediatric dentists will become more apparent.

### General Dentists/Dental Auxiliaries

The majority of practicing general dentists expect to reduce their work effort in pediatric dentistry as they get more established in their practices. The majority of dental auxiliaries are undertrained and underutilized for providing an expanded work effort in pediatric dentistry in both general dental and pediatric dental practices.

The conference concluded that these six factors are exerting major influence on the workforce crisis in pediatric dentistry. Not only is there an overwhelming need for more new pediatric dentists, but there is also a need for redistribution of the numbers of pediatric dentists throughout California. Likewise, the need to have general dentists treat more children in their practices was apparent as was the more appropriate utilization of better-trained dental auxiliaries.

### Conference Recommendations

The conference recommended increasing the number of new pediatric dentists in California. Since more than two-thirds of practicing pediatric dentists in California were educated in advanced education postdoctoral programs in California, the conference identified and analyzed five factors that would influence increasing the number of advanced education postdoctoral students in the four California programs.

### *Applicant Pool*

Although the applicant pool is very good in numbers and qualifications, much can be done at the predoctoral level to increase awareness of a career in pediatric dentistry.

The conference recommended that the California Society of Pediatric Dentists appoint five members to act as liaisons at each of the five California dental schools and that CSPD sponsor a program at each school to include study club membership and a senior student award to increase awareness.

### Faculty

There is a shortage in both clinical and career-track faculty in all postdoctoral programs in California. The shortage in clinical faculty is attributed to recruitment. The shortage of career-track faculty is attributed to the low numbers of research-qualified candidates and the compensation at California universities being inadequate for the state's cost of living. Without adequate clinical and career-track faculty, the postdoctoral programs cannot increase the number of students.

The conference recommended that CSPD appoint five members to act as liaisons to the five dental schools and that CSPD sponsor a reception for all five schools and their faculty at its annual

meeting to allow members and faculty an opportunity to interact and members to possibly agree to become predoctoral and/or postdoctoral faculty.

The conference further recommended that CSPD explore the feasibility of establishing a separate nonprofit foundation that could obtain funds from other nonprofit entities for faculty endowments and research.

## Facilities

Most of the postdoctoral programs have facility problems. These include outdated equipment, inadequate space, poor patient teaching pool, and inadequate research support. Inadequacies in onsite facilities often lead to offsite utilization with resultant loss of income at the onsite facility. This loss of income contributes to the lack of funds for facility upgrade, faculty, and students.

The conference recommended that CSPD explore the feasibility of establishing a separate nonprofit foundation that could obtain funds from other nonprofit entities to utilize for improvement and expansion of onsite facilities and/or the establishment of new offsite facilities. The conference recommended that CSPD support alumni groups at each of the postdoctoral programs in California that would support facility upgrade projects. The conference recommended that CSPD establish a regional advisory board to each of the postdoctoral programs to assist in innovative alternatives to onsite education, patient care, and research, such as new offsite faculty care affiliation and electronic offsite learning extensions.

## Patients

Patient shortages are common at many of the onsite facilities of postdoctoral programs. This often necessitates having students go off site, which results in a loss of revenue for the postdoctoral programs and loss of funding for onsite faculty improvement, increase in faculty and/or faculty compensation, and increase in students.

The conference recommended that CSPD continue to be a strong advocate for dental health care programs for children in California and that CSPD create a clearinghouse and network for new governmental and private insurance information in dental health care for children and that the dental school pediatric departments be involved in this process so that more patients may be procured.

## Dean Involvement

The deans of the five dental schools are the fiscal officers of their schools. As such, decisions about increasing postdoctoral students involve them. The conference recommended that CSPD implement a public relations program for each of the deans. This program could be individual as well as collective. It should involve key alumni at each school as well as CSPD leadership.

The conference further recommended that CSPD become involved with the California Dental Association's Council on Education and Professional Relations so that it understands the workforce crisis in pediatric dentistry.

The conference also suggested that CSPD host an annual meeting of all dental school pediatric dental department leadership to further communicate and perpetuate CSPD support for postdoctoral programs. The conference recommended that CSPD establish a new pediatric dental support system to include a mentor program, practice match program, and annual meeting reception. CSPD has already established a conference for new pediatric dentists that will alternate between Northern and Southern California. The first conference was held Aug. 20, 1999, in Los Angeles. The next will be in San Francisco in the spring of 2000.

More than one-third of practicing pediatric dentists in California are educated in postdoctoral programs outside of California. They may have been born or raised in California, or have gone to college or dental school in California. The conference did not cover this issue but attendees realized its importance. More information is needed as well as specific strategic management of this potential resource. A program should be designed and implemented by CSPD to attract more pediatric dentists to California that are educated out of state.

California has no specialty licensure laws. All pediatric dentists desiring to be licensed in California must pass a general dentistry licensure examination. This is often difficult and burdensome to practicing pediatric dentists from out of state. California does not have state board licensure reciprocity with other states, whereby a practicing pediatric dentist in another state can obtain licensure in California by credentials and reciprocity. While the conference did not cover either of these issues, attendees realize their importance. More discussion is needed as well as specific strategic management of this potential resource.

## Conclusion

The urgency to have more pediatric dentists in California is very apparent. California's pediatric population is increasing at a rate faster than any other state's. Yet, its number of practicing pediatric dentists is not keeping pace with this population explosion. More pediatric dentists must be trained in California dental schools. The applicant pool is

sufficient, but the number of postdoctoral program opportunities is insufficient to meet the demand. Too many recent graduates and practicing general dentists applying to postdoctoral programs in California are being turned away not due to poor qualifications, but due to lack of sufficient positions in these postdoctoral programs. California must increase the numbers of positions available in its postdoctoral programs.

Likewise, the postdoctoral programs in California must consider preferential admission to qualified applicants that express an interest in practicing full-time in California. Often, California loses postdoctoral students after completion of their program because they return to their state or country of origin. Also, many female postdoctoral students after completion of their program wish only to practice part time as they consider family goals. Some move to other states based upon the career goals of their husbands who may relocate outside California. The admission process to postdoctoral programs in California must consider the practice goals of the applicant and make every effort to offer preferential admission to those applicants expressing an interest in full-time practice in California.

To increase postdoctoral students in many of our California programs, they need more full-time faculty and alternative training sites. With the high cost of living and relatively average academic salaries in California, the state's programs have difficulty recruiting and retaining competent faculty. Furthermore, many postdoctoral programs that are in large metropolitan areas are experiencing declining patient numbers. California postdoctoral programs must revise their academic salary offerings to keep pace with its high cost of living so as to attract competent full time academic faculty. California postdoctoral programs must expand their off site, alternative training concepts to offer their postdoctoral students sufficient experiences in pediatric dentistry.

California dental schools must better prepare their graduates for the ever-increasing numbers of children in their practice career. California dental schools must also expand their continuing education programs to better prepare the practicing general dentist to treat this increasing pediatric population. Even with more pediatric dentists, the general dentists and their dental auxiliaries will be required to treat more children in the next century. All too frequently, as a general dentist gets established he or she raises the age level of admitted new patients to his/her practice often to the point of not accepting children at all. This trend must be reversed.

Finally, governmental funding programs for dental care for infants, children, and teenagers from low-income families must raise their reimbursement rates to keep pace with rising dental office expenses. Even if pediatric dentists and general dentists were available to treat indigent children with no dental insurance, they often decline to do so because of low reimbursement rates and lack of profitability in treating this large segment of California's pediatric population.

References
1. Waldman HB, Manpower planning: Planning for the children of your current pediatric dental patients. *J Dent* Child 62:418-25, 1995.
2. US Bureau of the Census, Population projections for states by age, sex, race and Hispanic origin: 1993 to 2020. Current Population Reports 1994, pp 25-111.
3. California Society of Pediatric Dentists, 1997. Unpublished data.
4. Council on Dental Practice, A Comparative Study of Male and Female Dental Practice Patterns. American Dental Association, Chicago, 1989.
To request a printed copy of this article, please contact/ Roger G. Sanger, DDS, MSEd, 633 Alvin Drive, Salinas, CA 93906.

CDA JOURNAL, VOL 27, Nº11

# Pediatric Oral Conscious Sedation: Changes to Come

Stanley F. Malamed, DDS, and Paul Reggiardo, DDS

**ABSTRACT** Recent media attention has focused the public's attention on issues surrounding pediatric oral conscious sedation. Under a law passed in 1998 and taking affect on Jan. 1, 2000, California dentists will be subject to certification and procedural provisions designed to ensure the educational qualification of the provider and the standards under which the procedure is performed. This article discusses the history of concern and regulation regarding sedation of children in the dental office.

AUTHORS

**Stanley F. Malamed, DDS,** is a professor and chair of the Anesthesia and Medicine Section of the University of Southern California School of Dentistry.

**Paul A. Reggiardo, DDS,** is District VI trustee of the American Academy of Pediatric Dentistry and a past president of the California Society of Pediatric Dentists. He is in private practice in Huntington Beach, Calif.

On Jan. 20, 1999, the television news show 60 Minutes II broadcast "Going to the Dentist," a segment reporting on the 1997 death of a 3-year-old in a dental office while undergoing general anesthesia.[1] Statements made on this program indicated that since 1991, in the state of California alone, five children had died receiving dental treatment under "anesthesia." Quoting Dr. Peter Hartmann, a member of the Board of Dental Examiners, "We have received testimony ... that possibly for each death, there's 40 bad scenarios. Something goes wrong, the child maybe becomes paralyzed ... so that's quite a few children ... getting injured." These statistics would indicate that at least 200 children in California have been injured from dental sedation since 1991. As a result, the Board of Dental Examiners passed tougher laws regulating the use of conscious sedation in children.

## History

Jan. 1, 2000, will open a new chapter of office safety requirements for children undergoing dental procedures involving the oral administration of conscious sedation. Under a law passed in 1998, California dentists will soon be subject to certification and procedural provisions designed to ensure the educational qualification of the provider and the standards under which the procedure is performed.

The chronology of state regulation of the dentist's ability to administer pharmacologic agents for the purpose of patient sedation began in 1979, when the legislature granted statutory authority to

CDA JOURNAL, VOL 27, Nº11

the state Board of Dental Examiners to govern dental office general anesthesia. A permitting process was established requiring onsite facility inspection and demonstration of competency. In 1989, the board assumed regulatory control over parenteral conscious sedation with passage of a law creating a similar permitting process. An important exemption was made, however, for drugs administered orally, under the assumption that such agents were somehow inherently safer and not likely to produce the misadventures and catastrophic accidents responsible for patient deaths. In fact, from 1976 to 1984, of the seven dental office deaths of minors associated with general anesthesia and sedation, only one had been associated with oral drug administration.

The fallacy of this argument became evident as the dentist's use of oral agents, especially for infants and children, increased following passage of the parenteral conscious sedation permitting law. Between 1991 and 1997 the board recorded the dental office deaths of five children. Four of the five were associated with oral conscious sedation.

Acting to prevent such tragedies in the future and prompted by the circumstances surrounding the death of a 4-year-old in Santa Ana, the board in September of 1997 voted to seek authority from the state legislature to regulate oral conscious sedation. Accordingly, an ad hoc committee of the board was established to draft proposed legislation. Sitting on that committee, in addition to members of the Board of Dental Examiners, were representatives from specialty organizations (including pediatric dentistry, oral and maxillofacial surgery, periodontics, and dental anesthesiology), representatives from the California Dental Association, and several dental educators.

It was immediately apparent from committee discussions that while it would be essential to do everything necessary to assure patient safety, it would also be important to consider the effect of legislation on the pediatric patient's access to care.

## Recommendations From Pediatric Dentistry

The California Society of Pediatric Dentists defined some of the issues involved in the proposed regulatory process as follows:

**Safety:** The safety of infants and children receiving dental treatment is the paramount consideration in proposed regulation of oral sedation. Infants and children may be placed at unnecessary risk of morbidity or mortality under the existing sedation law, which ignores orally administered drugs. The safe and effective use of an oral sedative agent by a dentist to a pediatric patient undergoing dental treatment requires a level of training, expertise, and proficiency that is not currently addressed by regulation and is not adequately provided by predoctoral dental education.

The administration of oral sedative agents to teenagers and adults is quite safe within recommended dosage levels and does not demand new regulation. There exists, in fact, no history of mortality or morbidity associated with oral administration of sedative agents to patients older than 12. However, the administration of oral sedative agents to infants and children requires unique techniques, dosages, and monitoring standards that differ from those employed in older patients.

**Access:** Once safety is ensured, the issue of access to dental care becomes critical. Legislative remedy should be designed so as to minimally impede the delivery of needed oral health care to infants and children. Unlike health conditions that will not worsen, or, like the flu, will even resolve, dental conditions will deteriorate without intervention. Infants and children, especially, are at risk for spread of this disease. This is a serious health problem that often demands urgent and definitive treatment that cannot be delayed, deferred, or ignored until the child is older. For some children with special needs, increasing age will make no difference in their ability to withstand or tolerate treatment without pharmacological assistance.

Infants, some children, and those individuals with special health and developmental needs may be unable to receive required dental treatment under normal office conditions. These patients must have the widest possible access to general anesthesia, parenteral conscious sedation, and oral conscious sedation techniques. Regulation should not be so unduly restrictive that it results in a lack of access to care for those most in need.

Whatever regulatory control is recommended and adopted should be the least intrusive and intimidating to the practitioner, while still accomplishing the objective of increasing patient safety. Legislation that unnecessarily discourages practitioners from providing care for which they are trained and capable will impede the delivery of health services necessary for comfort and the oral well-being of children.

**Role of education, training and expertise:** Examination of those few incidents associated with pediatric oral conscious sedation indicates that almost all are the result of errors of procedure or judgment largely avoidable with proper education and training and strict adherence to recognized guidelines for the

**TABLE 1**

| Documentation for Pediatric Oral Conscious Sedation Cases |
|---|
| 1. Patient name gender, age and weight |
| 2. Date of procedure |
| 3. Denal procedures performed and duration of sedation |
| 4. Description of the method, amount, and specific agent administered |
| 5. A statement on how the patient was monitored and by whom |
| 6. Legible copies of the patient record, including the preoperative evaluation, medical history, monitoring of vital signs throughout the procedure, and the patient's condition at discharge |
| 7. A signed patient record release |

safe administration of sedative agents. As long ago as 1983, The Dentists Insurance Company, in a retrospective study of deaths and morbidity in dental practices during a three-year period, concluded that in most of those incidents related to the administration of drugs, there were three common factors:

- Improper preoperative evaluation of the patient;
- Lack of knowledge of drug pharmacology by the doctor; and
- Lack of adequate monitoring during the procedure.[2]

Pediatric dentists, like their counterparts in oral surgery and periodontics, are carefully and thoroughly trained in the safe administration of conscious sedation as part of their advanced education programs, lasting two to three years beyond the dental degree. In addition, some general practice residency programs provide advanced education in conscious sedation techniques. Additional education and training, combined with appropriate and documented experience, should be taken into consideration when formulating regulatory legislation.

Operating under the American Academy of Pediatric Dentistry's Guidelines for the Elective Use of Pharmacologic Conscious Sedation and Deep Sedation in Pediatric Dental Patients, dentists have an excellent safety record utilizing sedation procedures.[3] Whatever regulations are adopted should be consistent with these guidelines and those of the American Dental Association.[4]

The committee's deliberations were not easy, with the debate at times rancorous. Consideration was given to merely removing the existing exemption for oral sedation and placing all conscious sedation into the parenteral conscious sedation permit. Others argued for a separate oral conscious sedation permit, with requirements similar to those of general anesthesia and parenteral conscious sedation. Ultimately, an innovative solution emerged recognizing educational qualification and compliance with recognized standards of care as the keystones to patient safety.

## Assembly Bill 2006

Following approval by the Board of Dental Examiners in January of 1998, the proposed pediatric oral conscious sedation statute was introduced in the state legislature by Assemblyman Fred Keeley (D-Boulder Creek) as Assembly Bill 2006. Co-sponsored by the board and California Dental Association, the bill was signed into law by then-Gov. Pete Wilson in September 1998. The measure, which took effect Jan. 1, 1999, grants the Board of Dental Examiners the legal authority, for the first time in California history, to govern a dentist's conduct in the administration of oral sedative agents to minors younger than 13. Unlike the existing general anesthesia and parenteral conscious sedation permits, the new law specifies a certification process governed initially by educational qualification and later by continuing education. Dentists holding the certificate will have to comply with new sections of the Dental Practice Act concerning the presence of the dentist, the physical evaluation of the patient, record keeping, and equipment and monitoring standards.

AB 2006 requires that after Dec. 31, 1999, no dentist in California shall administer or order the administration of oral sedative agents to a dental patient younger than 13 unless the dentist holds either a general anesthesia permit, a parenteral conscious sedation permit, or has been issued a pediatric oral conscious sedation certificate. The law is very specific in its definition of oral conscious sedation, written in statute as a "minimally depressed level of consciousness produced by oral medication that retains the patient's ability to maintain independently and continuously an airway, and respond appropriately to physical stimulation and verbal command."[5] Dentists who administer sedative agents that take a minor patient beyond this level (e.g., level 3 or 4 in the American Academy of Pediatric Dentistry's Guidelines[3]), intentionally or inadvertently, are required to possess the parenteral conscious sedation or general anesthesia permit regardless of route of administration.

AB 2006 provides two routes by which the dentist may qualify for the issuance of the oral conscious sedation certificate. The first is by educational qualification and the second is by demonstration of prior experience and competence.

The educational qualification may be met by one of the following:

- Satisf minor dental patients. (Regulations governing board-approved courses were expected to be adopted in

August and should be in place by the publication date of this paper).

Demonstration of prior experience and competence may be met by submission of 10 cases of oral conscious sedation of a minor dental patient completed by the applicant prior to Aug. 31, 1998, documenting satisfactory performance as defined by set criteria.

(At the time of this writing, those criteria were under development by an expert advisory panel to the Board of Dental Examiners). Required documentation for pediatric oral conscious sedation patients is listed in

Once the pediatric oral conscious sedation certificate is obtained, the certificate holder will be required to complete a minimum of seven hours of study in each biannual license renewal period as a condition for certification renewal. These seven hours of continuing education in board-approved courses will be applicable to the board's continuing education requirements for general licensure.

## Epilogue

In the July 1999 issue of Redbook magazine, a report titled "The deadly risk your dentist may take" queried "Could a relatively simple dental procedure leave your child brain damaged – or worse?"[6] The article concluded with five questions that should be asked by parents of any doctor (physician or dentist) contemplating the use of sedation on a child. They are:

- Are you planning to sedate my child?
- Who will monitor my child while the dentist works on his teeth?
- What kind of monitoring equipment do you use?
- Are you and your assistants trained in resuscitation? and
- Will you continue to monitor my child after the procedure, until the drug has completely worn off?

Increased public awareness of a potential problem, in addition to increased regulation of the profession in this very important area can only serve to increase the safety of pediatric oral conscious sedation.

Emphasizing the importance of this proposed regulation, on Sept. 15, 1999, a 3-year-old child died in a California dental office. Although at the time of this writing much information needs to be reviewed before a definitive cause of death can be attributed, the child received an oral sedative for premedication.[7]

References
1. Riback R (producer), Going to the dentist. 60 Minutes II CBS television, Jan. 20, 1999.
2. deJulien LE, Causes of severe morbidity/mortality cases, J Cal Dent Assoc 11(2):45, 1983
3. American Academy of Pediatric Dentistry, Guidelines for the elective use of conscious sedation, deep sedation, and general anesthesia in pediatric patients. Revised May 1998. *Pediatr Dent* 21 (Reference Manual 1999-00) 58-73, 1999
4. Council on Dental Education, American Dental Association, Guidelines for teaching the comprehensive control of pain and anxiety in dentistry. *J Dent* Educ 36:62, 1972.
5. Proposed regulations, Article 5.5 Oral Conscious Sedation. Board of Dental Examiners, Sacramento, Calif, 1999
6. Wills F, The deadly risk your dentist may take. Redbook July 1999:123-4.
7. Dong-Phuong N, Tot was given liquid premedication at home. San Diego Union Tribune, Sept 17, 1999

CDA JOURNAL, VOL 27, Nº11

# Effects of Materials Used in Pediatric Dentistry on the Pulp: A Review of the Literature

David L. Good, DDS

**ABSTRACT** This paper reviews a selection of materials used in treating children's teeth. Often, the success of the material is determined by its effect on the underlying pulp tissue, either by virtue of its direct effect or in its ability to prevent ingress of contaminants. The materials reviewed will include some of those used for cavity liners, bases, restorations, pulp capping, and pulpotomies.

AUTHOR

**David L. Good, DDS,** is a clinical professor in the Department of Pediatric Dentistry at University of Southern California School of Dentistry.

A variety of materials have been used in the treatment of children's teeth. Many were adopted for use in primary teeth because of their successful use with permanent teeth. Other materials seem to empirically perform better in either primary or permanent teeth, but not in both. Some materials that appeared to be promising when introduced did not fulfill the manufacturers' claims when used clinically. A large number of studies related to the biocompatibility of materials cited in the literature involve research on permanent teeth. In many instances, similar information is missing for primary teeth. Extrapolation of these results for use in primary teeth, in many cases, is based on clinical experience alone. This paper will review a selection of materials used in treating children's teeth. Often, the success of the material is determined by its effect on the underlying pulp tissue, either by virtue of its direct effect on the pulp or in its ability to prevent ingress of contaminants to the pulp. The materials reviewed will include some of those used for cavity liners, bases, restorations, pulp capping, and pulpotomies.

## Nonadhesive Liners and Bases

### *Calcium Hydroxide*

Many authors have described the use of calcium hydroxide for pulp capping (direct and indirect), pulpotomies, and apexification procedures.[1-8] Schroeder[9] found the initial pulp tissue reaction to

calcium hydroxide in healthy human pulp tissue to be a superficial three-layered necrosis consisting of a firm necrosis with edema and thrombosis, a liquefaction necrosis with edema, and a coagulation necrosis in the apical zone. This was followed by mineralization with spherical foci of mineralization adjacent to vital pulp tissue in seven days. At one month, there was a coronal layer of irregular bone-like tissue with cellular inclusions. At three months, two layers could be identified – coronally irregular tissue and pulpally dentin-like tissue lined by odontoblasts. Schroeder also found considerable internal resorption, which she said was caused by a chronic inflammation present due to a blood clot between the wound surface and the calcium hydroxide or bacteria present in the pulp tissue.

By changing the pH, one might get bridging without the necrotic changes. Heys and colleagues10 studied rat pulps treated with Dycal (pH of 11) and Pulpdent (pH 12). The pulps were examined at three days, and they demonstrated hemorrhage and acute inflammatory cells. At five weeks, the Dycal-treated pulps had a moderate pulpal response with some chronic inflammatory cells, and the Pulpdent-treated pulps had moderate to severe pulpal responses.

Cox and colleagues 3 studied pulp capping with calcium hydroxide with a one- and two-year observation period. They found that nine out of 29 teeth with nonexposed pulps demonstrated a moderate grade 2 chronic inflammation. Reparative dentin at one year equaled 149 F m and at two years equaled 162 F m. In the exposed pulps, 45 of 91 demonstrated pulpal healing; nine of 91 were totally necrotic; 25 of 91 had acute inflammatory lesions; and 12 of 91 demonstrated a chronic inflammatory response.

Since calcium hydroxide does produce bridging (mineralization), will this act as a barrier and protect the pulp? Goldberg and colleagues11 evaluated bridging in intact human premolars. Three to eight months following treatment, the teeth were examined histologically; and the coronal surface of the bridge showed crystals of different shapes, sizes, and dispositions. The pulpal surface of the bridge was formed by the coalescence of calcospherites and a great number of holes. The holes were oval with diameters of from 20 to 250 F m, and leakage analysis showed passage of methylene blue dye through the holes.

Cox and colleagues[12] studied tunnel defects in dentin bridges in monkeys. Pulp tissue in 235 teeth were exposed and capped with calcium hydroxide. Hard-tissue dentin bridges were observed in 192 teeth. Multiple tunnel defects with subjacent pulp tissue inflammation were noted in 172 teeth, with some showing necrosis. The defects were patent and filled with capillaries and inflammatory cells.

Liners and bases placed on nonexposed and exposed dentin need to seal the dentin and be biocompatible with the pulp. Calcium hydroxide, though initially bactericidal to bacteriostatic, does not adhere to dentinal tubules, dissolves after one year, does not adhere to composite resin systems, and degrades upon tooth flexure.[6] There is a necrotic zone in the pulp tissue at the interface of the calcium hydroxide with the pulp.[9] This produces a chronic inflammatory response and prevents pulpal healing.

Calcium hydroxide does stimulate mineralization and form a dentin bridge. This hard tissue dentin bridge does not act as a protective barrier because it has many tunnel defects and holes.[11,12] Using calcium hydroxide as a liner does not satisfy the need for a liner that seals the dentin and is biocompatible with the pulp.

Clinically, calcium hydroxide should probably be used for apexification, root end closure, and possibly in the Cvek technique when one treats a complicated crown fracture in the immature permanent tooth. Its use in primary teeth is questionable.

### *Zinc-Oxide and Eugenol*

Eugenol and related compounds have a long history of use in dentistry as an obtundant, base, and temporary filling. Eugenol is found in clove oil and is related to phenol, a weakly acidic alcohol. When eugenol is mixed with zinc-oxide, a chelation reaction occurs, and zinc-eugenolate is formed. When ZOE is exposed to an aqueous medium such as saliva or dentinal fluid, a hydrolysis occurs yielding eugenol and zinc hydroxide.[13]

Trowbridge and colleagues[14] found that eugenol liquid and ZOE paste blocks intradental nerve activity. This may explain why it is able to allay tooth pain. The effects of eugenol on tissue appear to be highly dependent on tissue concentration of eugenol. Direct application of eugenol to the pulp tissue (high dose) is toxic and induces cell death and vascular changes and inhibits cell growth and respiration. ZOE placed on dentin releases eugenol from ZOE through dentinal tubules to the pulp (low dose) and inhibits prostaglandin synthesis, nerve activity, and white cell chemotaxis, which is beneficial for reducing inflammation.[13]

Hume,[15] in describing the pharmacology and toxicology of ZOE, stated that the bioavailability of eugenol when placed on dentin peaks after one day. Ten days after placement of ZOE, 50 percent of the one-day release is still present. He also notes that ZOE on dentin acts as a seal by excluding inward

diffusion of dietary substrate from cariogenic bacteria, as well as bacterial toxic end products.

Watts and colleagues16 placed ZOE on small exposures in germ-free rat teeth and after 28 days found chronic inflammation and/or necrosis in every tooth where there was direct contact of ZOE with the pulp. This negates the use of ZOE as a liner in deep carious lesions.

Attempts at using ZOE as a pulpotomy medicament also have generally been unsuccessful. In a histologic study on teeth in dogs, pulps treated with a plain reinforced ZOE all demonstrated a moderate to severe chronic inflammatory response in the coronal one-third of the canal. If the pulps were first treated with formocresol, the inflammation under the ZOE was milder.[17]

Since ZOE is an excellent dentin sealer, its use as a base material may still be indicated beneath amalgam restorations and the cementation of stainless steel crowns, but it is not indicated as a base beneath composite restorations because it may interfere with the polymerization of composite resins. ZOE is the material of choice to fill root canals in primary teeth following a formocresol pulpotomy or pulpectomy because it is resorbed18 along with the primary roots at the time of exfoliation.

When using ZOE to fill root canals in primary teeth, one must not use reinforced ZOE or the filler material will not resorb. This may produce delayed and/or ectopic eruption of the succedaneous permanent tooth.

## Pulpotomy Medicaments

Exposure of pulpal tissue in primary teeth due to dental caries is common. Therefore pulpotomy and pulpectomy therapy in primary teeth is an integral part of pediatric dentistry. The problem is in determining what medication to place in the pulp chamber and/or root canals to ensure successful treatment.

The pulp can heal itself if no bacteria or bacterial products are present. Kakehashi and colleagues performed pulpotomies on gnotobiotic rats in a germ-free environment.[19] Even when food debris was present in the pulpotomy site, a dentinal bridge was laid down and the pulps healed. Cariously exposed pulps treated clinically have bacteria and/or bacterial products present in the pulp chambers, therefore bactericidal medicaments must be used to ensure a successful pulpotomy treatment. If one could place a medicament in the pulp that would kill the bacteria and seal the tooth from the oral environment, one could conceivably allow the tooth to heal. Many medicaments have been tried with varying success.[20-25]

The medicament of choice for many years has been formocresol. Formocresol is bactericidal in a concentration of 1.5 percent when applied for two minutes to bacteria and yeast forms.[26] Berger[20] performed pulpotomies in primary molars using formocresol as a pulpotomy dressing. At three weeks, he found superficial debris below the amputation site, then a compressed layer with good cellular detail. In the middle third of the root canal, he found early coagulation necrosis, and the apical portion of the canal had late coagulation necrosis to the foramen. At seven weeks, the coronal and middle third of the canal were the same as at three weeks, but the apical third showed an ingrowth of granulation tissue from the apical foramen. Specimens examined from a later period showed the same results except that the granulation tissue appeared in the middle and coronal portions of the canal. Magnusson[21] performed formocresol pulpotomies in 110 roots in 56 primary molars. Between six and 30 months following the pulpotomies, histologically none of the roots showed healed pulps; 16 roots (15 percent) were necrotic; 89 roots (81 percent) had internal resorption with or without repair; and 13 roots (12 percent) showed slight infiltration of inflammatory cells. In addition, formocresol may be found systemically following pulpotomy treatment. Formocresol has been found in blood, urine, and lung, liver, and kidney tissue.[27,28]

Because of these findings, other medicaments have been substituted for formocresol with varying success. Glutaraldehyde histologically had a similar pulp reaction and residual effect as formocresol.[22,29] Ferric sulfate has also been used in pulpotomies with good clinical success.[24,30] However, the degree of inflammation present in the root canals was similar to the formocresol group.[23,24] Added to this list of medicaments for use in pulpotomies are calcium hydroxide and ZOE, which were discussed previously. Neither calcium hydroxide1,[10] nor ZOE has been successful for pulpotomies in primary teeth.

Formocresol is still considered the medicament of choice for pulpotomy treatment in primary teeth. Clinically the success rate is more than 90 percent,[31,32] although histologically the results are less and variable.[33] It is recommended that it be used in the diluted form (4 percent formaldehyde) to reduce the amount of possible systemic absorption.[34] Further studies need to be done to verify if a 1.5 percent or 2 percent solution of formaldehyde will be successful in pulpotomy treatment in primary teeth. Diluting the formocresol to this level might reduce the possibility of systemic absorption.

## Adhesive Liners

With the introduction of adhesive dentistry, many of the materials tested in permanent teeth are now being used in both primary and permanent teeth in children. The results in primary teeth are often similar to those found in permanent teeth. Many studies have indicated that composite materials are compatible with pulp tissue.[6,35-37]

The success of adhesive dentistry is dependent on etching the enamel and dentin of the tooth requiring a restoration. When phosphoric acid was used as an etching agent, even in teeth with pulp exposures, it did not produce inflammation and/or necrosis.[29,38-40] Brannstrom[38] inadvertently etched teeth with small pulp exposures. He reported that when infection was avoided, there was no damage or inflammation to the pulp. Pashley[39] delineated some variables regulating the type of pulpal response to acid etching. They are the type of acid, pKa and pH, applied concentrations, the time of etching (acid challenge = time x concentration), remaining dentin thickness, and the ability of subsequently placed restorative materials to seal the dentin. The use of phosphoric acid to remove the smear layer and allow cohesive hybridization is not detrimental to the pulp.

Various adhesive liners have been tested with good results. Horsten-Bindslev[41] placed Gluma Dentin Bond (glutaraldehyde, water, and hydroxyethylmetacrylate) in deep cavities in monkeys. At eight days, 19 of 23 had slight or no inflammation, and 20 of 23 had no bacterial penetration. At 90 days, 20 of 20 had slight or no inflammation, and 20 of 20 had no bacterial penetration.

Pashley and colleagues[42] tested the dentin permeability to various liners after etching with phosphoric acid. They etched 0.7 mm dentin discs (all having an artificial smear layer) with 37 percent phosphoric acid for two minutes. The authors found that:

- The phosphoric acid allowed 100 percent penetration.
- Barrier (a polyamide liner) with one coat allowed 44.2 percent leakage.
- Copalite (a copal varnish) allowed 49.4 percent leakage.
- Scotchdond (an adhesive resin) with one coat light-cured allowed 7.7 percent leakage.
- Hydroxyline (a calcium hydroxide liner) with one coat allowed 11.8 percent leakage, and
- A calcium oxalate liner allowed 2.5 percent leakage.

Usami and colleagues35 tested the pulpal response of a light-activated fluoride-releasing adhesive liner in dogs. All cavity preps were within 1 mm of the pulp. At three, 30, and 90 days, there was none to slight inflammatory response; and no bacterial penetration found on either the dentin or in the dentinal tubules.

Cox and colleagues 6 studied four composite lining materials using HEMA as a primer (which is hydrophilic) and both light activated and autopolymerizing bonding agents (which are hydrophobic). They found that there was cohesive hybridization and that the hybrid layer penetrated the dentin 5-7 F m. The only restorations that produced a pulpal response were those that allowed bacteria and bacterial products into the dentinal tubules with subsequent inflammation and/or necrosis.

Tsuneda and colleagues[36] tested four adhesive liners placed directly on exposed pulp tissue in Wistar rat molars. At three days, the inflammatory infiltrate was similar in all materials; but, in the seven-day specimens, only one showed none to slight inflammatory response. In the evaluation of microleakage, the one with none to slight inflammation at seven days demonstrated no microleakage. The other three liners all had microleakage with bacterial penetration.

Kitasako and colleagues[37] performed direct pulp caps on exposed monkey teeth using four adhesive resin systems. The diameter of the exposures ranged from 0.3 mm to 1.3 mm. The materials tested were All-Bond 2, Bond Well LC, Liner Bond II, and Superbond C&B. The specimens were examined at seven, 14 and 60 days. There was no bacterial penetration along the cavity walls, and no moderate or severe inflammatory reaction was found in any of the specimens. Kopel[43] has advocated the use of adhesive liners for pulp capping procedures in primary teeth, however, there have been no scientific studies to date that support this procedure.

The results of the studies cited above are important to consider when choosing an adhesive liner. Equally important is the technique utilized in placing these materials, whether in the primary or permanent tooth. The ability of the liners to seal the dentin and prevent bacteria and bacterial products from contaminating the pulp are critical to ensure pulpal healing.

There are some minor problems with the use of the resin-based systems. There is a release of formaldehyde from composite restorations. Oysaed and colleagues tested nine composites and found a continuous release of formaldehyde during the first 10 days. Formaldehyde release was still detectable 115 days after polymerization.[44] In addition, Olea and colleagues found bisphenol A and dimethacralate in saliva samples following placement of sealants in humans.[45] Both of these compounds display estrogenic activity (xenoestrogens). Hamid and Hume examined the chemical release

from seven light-cured pit and fissure sealants available in the United States and could not detect any bisphenol-A release.[25] Solderholm and colleagues reviewed the literature on the synthesis of BIS-GMA and its biological effects in cell culture and animals. They concluded that based on existing research, it must be accepted that certain impurities may be present in some BIS-GMA resin; and these impurities, when released from restorations, are potentially estrogenic. Under extreme conditions, these impurities are capable of inducing weak estrogenic effects on target tissues. However, the amounts of bisphenol A that may be present as an impurity or produced as a degradation product from dental restorations are quite small and far below doses needed to affect the reproductive tract.[46]

In addition, even with cohesive hybridization, nanoleakage of adhesive bonding systems does occur.[47] This could be due to marginal gaps between the resin and the dentin of the cavity preparations. Arbabzadeh and colleagues compared the bond strength and marginal discrepancies of five adhesive systems.[48] They measured the gap widths at five sites and found that the best adhesive system, All Bond 2, had gap widths of 1.6 to 4.7 F m. The other four materials had even greater marginal discrepancies.

Research is needed to provide better adhesive systems without polymerization shrinkage in order to eliminate marginal gaps and seal the pulp from bacteria and bacterial products so it can heal. Research is also needed to create materials free of impurities and degradation products.

### *Restorative Materials*

The restorative materials used in pediatric dentistry (e.g., amalgam, composite resins, glass ionomer cement, resin-modified glass ionomer cement, and stainless steel crowns cemented with zinc-phosphate or polycarboxylate cement) will not produce inflammatory responses in the pulp as long as a seal can be achieved to prevent microleakage to the pulp tissue.[49,50]

Yakushiji and colleagues51 studied the effects of glass ionomer as a base in human teeth with an average of 1.68 mm of dentin overlying the pulp. The restorative materials placed over the glass ionomer bases were amalgam and composite resin. Histologic sections were done between two and 219 days following placement of the restorations. The authors found "no to slight" inflammation at all periods when both the amalgam and composite restorations covered the glass ionomer bases.

Gaintantzopoulou and colleagues[52] evaluated pulpal reactions to light-cured glass ionomer cements. They prepared deep Class V preparations in 96 teeth from three young beagles. The animals were sacrificed at one, four, and 12 weeks following the operative procedure. No etching was done prior to the placement of the glass ionomer cement. Ninety-one of the specimens had intact cavity floors and 89 of the pulps had a mild reaction with two having a moderate response. Eighty-two of the specimens were bacteria-free. The authors concluded that light-cured glass ionomer cements do not impair pulpal healing.

Pulpal response to a resin modified glass-ionomer material was studied by Tarim and colleagues[53] on both nonexposed and exposed monkey pulps. Tissues were collected at six to seven, 21 to 27, and 90 to 97 days. Except for one resin-modified glass-ionomer-treated pulp at six days in the nonexposed group, the inflammatory response was mild. In eight of 36 teeth in which resin modified glass ionomers were placed over pulpal exposures, the pulps showed various grades of inflammatory response, all associated with stained bacteria. Bacterial staining data in the nonexposed pulps indicated that the resin-modified glass ionomer provided a complete seal against microleakage in 17 cavities at 21 and 97 days.

Some of the advantages of the glass-ionomer cements, according to the manufacturers, are that etching is not needed prior to their placement, fluoride is released, and they adhere to dentin. Even with these advantages, their biggest disadvantage is their inability to seal and prevent bacterial ingress to the pulp tissue. As previously discussed, this variable is critical to the success of any material.

Cox and colleagues[49] tested amalgam, zinc-phosphate cement, composite resin, and silicate cement on exposed pulps in monkeys. One half of the cavities were surface sealed with ZOE, and the other half were restored to the cavosurface margin with the test materials. Sixty-five percent of the unsealed amalgam restorations showed moderate to severe inflammation and had bacteria present on the cavity walls. Twelve percent of the sealed amalgam restorations showed slight inflammation, and 12 percent had bacterial staining on the cavity walls. All of the unsealed composite restorations showed severe inflammation and necrosis and had bacterial staining, while 40 percent of the sealed restorations had slight inflammation, and 50 percent showed bacterial staining.

Fuks and colleagues[50] surface sealed composite restorations in baboon teeth. At 90 days, 11 teeth had no inflammation, and one tooth had a slight inflammatory response.

The materials used to restore teeth in children will not produce inflammatory

responses in the pulp as long as the tooth is sealed. One of the possible reasons for the lack of sealing in primary teeth is the fact that primary enamel is not as mineralized as permanent enamel and therefore does not etch in the same manner as permanent teeth. Wilson and colleagues[54] found when primary incisors and canines where compared with their homologous successors overall mineralization levels were lower in the primary dentition and when primary molars were compared to premolars, the primary molars were also relatively less mineralized. There are other shortcomings to these restorative materials. Silver amalgam still has the mercury controversy,[55-57] and the composite resins have the problems discussed earlier.

## Conclusions

This paper has reviewed some of the materials used in the treatment of primary teeth and their effect on the pulp tissue. Admittedly, the current paper is an attempt to present some key points from a large body of information. Most of the previous literature has been limited to studying the effects of materials on permanent teeth. (For an excellent review of this subject, the reader is referred to a paper by Schuster and colleagues.[58]) This review has attempted to present some of the problem areas that must still be addressed with the materials used in the treatment of children.

The best-case scenario for treatment is still prevention so as to avoid the use of any materials for the restoration of teeth. When one must do a pulpotomy or restore a primary tooth, one must choose and use the available materials carefully, basing the decision on scientific data and successful clinical outcomes. Additional clinical and histologic studies need to be done on primary teeth to demonstrate which materials will give the best long-term results. It is hoped that there soon will be other classes of materials – such as mineral trioxide aggregate, freeze dried bone, and cloned enamel – that might better satisfy the need to seal the dentin and restore teeth in both the primary and permanent dentitions. The ideal restorative material would be tooth-colored, be easily placed in a cavity preparation, have adhesive qualities, and prevent the ingress of bacteria and bacterial products from the oral cavity.

References


1. Schroder U, Szpringer-Nodzak M, et al, A one year follow-up of partial pulpotomy and calcium hydroxide capping in primary molars. Endod Dent Traumatol 3:304-6, 1987.
2. Warfvinge J, Rozell B, Hedstrom K-G, Effect of calcium hydroxide treated dentine on pulpal responses. Int Endod J 20:183-93, 1987.
3. Cox C, Bergenholtz G, et al, Pulp capping of dental pulp mechanically exposed to oral microflora: a 1-2 year observation of wound healing in the monkey. J Oral Pathol 14:156-68, 1985.
4. Foreman PC, Barnes IE, A review of calcium hydroxide. Int Endo J 23:283-97, 1990.
5. Matsuzaki K, Fujii H, Machida Y, Experimental study of pulpotomy with calcium hydroxide-iodoform paste in dogs' immature permanent teeth. Bull Tokyo Dent Coll 31:9-15, 1990.
6. Cox CF, Suzuki S, Re-evaluating pulp protection: calcium hydroxide liners vs. cohesive hybridization. *J Am Dent Assoc* 125:823-31, 1994.
7. Kontakiotis E, Nakou M, Georgopoulou M, In vitro study of the indirect action of calcium hydroxide on the anaerobic flora of the root canal. Int Endod J 28:285-9, 1995.
8. Qin M, Zhang S, et al, Calcium hydroxide compound pulpotomies for primary teeth: A clinical study of two-year follow-up. Ped Dent J 8:25-30, 1998.
9. Schroder U, Effects of calcium-hydroxide-containing pulp-capping agents on pulp cell migration, proliferation and differentiation. *J Dent* Res 64:541-8, 1985.
10. Heys RJ, Heys DR, et al, The response of four calcium hydroxides on monkey pulps. J Oral Pathol 9:372-9, 1980.
11. Goldberg F, Massone EJ, Spielberg C, Evaluation of the dentinal bridge after pulpotomy and calcium hydroxide dressing. J Endod 10:318-20, 1984.
12. Cox CF, Subay RK, et al, Tunnel defects in dentin bridges: their formation following direct pulp capping, Oper Dent 21:4-11, 1996.
13. Markowitz K, Moynihan M, et al, Biologic properties of eugenol and zinc-oxide eugenol. Oral Surg Oral Med Oral Pathol 73:729-37, 1992.
14. Trowbridge H, Edwall L, Panopoulos P, Effect of ZOE and Ca(OH)2 on intradental nerve activity. J Endod 8:403-6, 1982.
15. Hume WR, The pharmacologic and toxicological properties of zinc oxide-eugenol. *J Am Dent Assoc* 113:789-91, 1986.
16. Watts A, Patterson RC, Pulpal response to a zinc oxide-eugenol cement. Int Endod J 20:82-6, 1987.
17. Garcia-Godoy F, A comparison between zinc-oxide eugenol and polycarboxalate cement on formocresol pulpotomies. J Pedod 6:203-17, 1982.
18. Augsburger RA, Peters DD, Radiographic evaluation of extruded obturation materials. J Endod 16:492-7, 1990.
19. Kakehashi S, Stanley HR, Fitzgerald RJ, The effects of surgical exposure of dentin pulps in germ-free and conventional rats. Oral Surg Oral Med Oral Pathol 20:340-9, 1965.
20. Berger JE, Pulp tissue reaction to formocresol and ZOE. *J Dent* Child 32:13-28, 1965.
21. Magnusson BO, Therapeutic pulpotomies in primary molars with the formocresol technique. ACTA Odontol Scand 36:157-65, 1978.
22. Fuks AB, Bimstein E, Michaeli Y, Glutaraldehyde as a pulp dressing after pulpotomy in primary teeth of baboon monkeys. Pediatric Dent 8:32-6, 1986.
23. Cotes O, Boj J, et al, Pulpal tissue reaction to formocresol vs. ferric sulfate in pulpotomized rat teeth. J Clin *Pediatr Dent* 21:247-54, 1997.
24. Fuks AB, Eidelman E, et al, Pulp response to ferric sulfate, diluted formocresol and IRM in pulpotomized primary baboon teeth. *J Dent* Child 64:254-9, 1997.
25. Hamid A, Hume WR, A study of component release from resin pit and fissure sealants in vitro. Dent Mater 13:103-10, 1997.
26. Hill SD, Berry CW, et al, Comparison of antimicrobial and cytotoxic effects of glutaraldehyde and formocresol. Oral Surg Oral Med Oral Pathol 71:89-95, 1991.
27. Ketley CE, Goodman JR, Formocresol toxicity: Is there a suitable alternative for pulpotomy of primary molars. Int J Paed Dent 2:67-72, 1991.
28. Araki K, Isaaka H, et al, Excretion of 14C-formaldehyde distributed systemically through root canal following pulpectomy. Endod Dent Traumatol 9:196-9, 1993.
29. White KC, Cox CF, et al, Pulpal response to adhesive resin systems applied to acid-etched vital dentin: damp versus dry primer application. Quintessence Int 25:259-68, 1994.
30. Fey A, Udin R, Johnson R, A clinical study of ferric sulfate as a pulpotomy agent in primary teeth. Pedatr Dent 13:327-32, 1991.
31. Law DB, Lewis TM, Formocresol pulpotomy in deciduous teeth. *J Am Dent Assoc* 69:601-7, 1964.
32. Redig DF, A comparison and evaluation of two formocresol pulpotomy techniques utilizing "Buckley's" formocresol. *J Dent* Child 35:22-30, 1968.
33. Rolling I, Lambjerg-Hansen H, Pulp condition of successfully formocresol-treated primary molars. Scand *J Dent* Res 86:267-72, 1978.
34. Morawa AP, Straffon LH, et al, Clinical evaluation of pulpotomies using dilute formocresol. *J Dent* Child 42:360-3, 1975.
35. Usami Y, Okamoto A, et al, Pulpal response to a new light-activated fluoride releasing liner. Dent Mater 9:344-349, 1993.
36. Tsuneda Y, Hayakawa T, et al, A histopathological study of direct pulp capping with adhesive resins. Oper Dent 20:223-9, 1995.
37. Kitasako Y, Inokoshi S, et al, Short-term reaction of exposed monkey pulp beneath adhesive resins. Oper Dent 23:308-17, 1998.

38. Brannstrom M, Communication between the oral cavity and the dental pulp associated with restorative treatment. Oper Dentistry 9:57-68, 1984.
39. Pashley DH, The effects of acid etching on the pulpodentin complex, Oper Dent 17:229-42, 1992.
40. Gilpatrick RO, Johnson W, et al, Pulpal responses to dentin etched with 10% phosphoric acid. Am *J Dent* 9:125-9, 1996.
41. Horsten-Bindslev P, Monkey pulp reactions to cavities treated with gluma dentin bond and restored with a microfilled composite. Scand *J Dent* Res. 95:347-55, 1987.
42. Pashley EL, Galloway SE, Pashley DH, Protective effects of cavity liners on dentin. Oper Dent 15:10-7, 1990.
43. Kopel HM, The pulp capping procedure in primary teeth "revisited." *J Dent* Child 64:327-33, 1997.
44. Oysaed H, Ruyter IE, Sjovik Kleven IJ, Release of formaldehyde from dental composites. *J Dent* Res 67:1289-94, 1988.
45. Olea N, Pulgar R, et al, Estrogenicity of resin-based composites and sealants used in dentistry. Environ Health Perspect 104:298-305, 1996.
46. Soderholm K, Phil M, Mariotti A, BIS-GMA based resins in dentistry: Are they safe? *J Am Dent Assoc* 130:201-9, 1999.
47. Sano H, Yoshiyama M, et al, Comparative SEM and TEM observations of nanoleakage within the hybrid layer. Oper Dent 20:160-7, 1995.
48. Arbabzadeh F, Gage JP, et al, Gap measurements and bond strength of five selected adhesive systems bonded to tooth structure. Australian Dent J 43:175-80, 1998.
49. Cox CF, Keall HJ, et al, Biocompatability of surface-sealed dental materials against exposed pulps. J Prosth Dent 57:1-8, 1987.
50. Fuks AB, Funnell B, Cleaton-Jones P, Pulp response to a composite resin inserted in deep cavities with and without a surface seal. J Prosthet Dent 63:129-34, 1990.
51. Yakushiji M, Kinumatsu T, et al, Effects of glass ionomer cement on the dental pulp and its efficiency as a base material. Bull Tokyo Dent Coll 20:46-59, 1979.
52. Gaintantzopoulou MD, Willis GP, Kafrawy A, Pulp reactions to light-cured glass ionomer cements. Am *J Dent* 7:39-42, 1994.
53. Tarim B, Hafez A, Cox C, Pulpal response to a resin-modified glass-ionomer material on non-exposed and exposed monkey pulps. Quintessence Int 29:535-42, 1998.
54. Wilson PR, Beynon AD, Mineralization differences between human deciduous and permanent enamel measured by quantitative microradiography. Arch Oral Biol 34:85-8, 1989.
55. Mandel ID, Occupational risks in dentistry: comforts and concerns. *J Am Dent Assoc* 124:41-9, 1993.
56. Dilley DC, Bawden JW, Mercury exposure due to environmental factors and amalgam restorations in a sample of North Carolina children. *Pediatr Dent* 21:114-7, 1999.
57. Mackert JR, Dental amalgam and mercury. *J Am Dent Assoc* 122:54-61, 1991.
58. Schuster GS, Lefebvre CA, et al, Biocompatibility of posterior restorative materials. *J Calif Dent Assoc* 24:17-31, 1996.
To request a printed copy of this article, please contact/David L. Good, DDS, Department of Pediatric Dentistry, USC School of Dentistry, 925 W. 34th St., Los Angeles, CA 90089-0641.

CDA JOURNAL, VOL 27, Nº11

# Reporting Child Abuse and Neglect: Responding to a Cry for Help

KATHLEEN A. SHANEL-HOGAN, DDS, AND JULIE A. JARRETT, RDA, BS

**ABSTRACT** Dentists, registered dental hygienists, and registered dental assistants are designated by law as mandated reporters who are required to report suspected cases of abuse and neglect while in their professional capacities. By taking a proactive role in the detection and reporting of child abuse and neglect, dental mandated reporters may save the lives of young victims and assist agencies in helping families in the community. It is vitally important that mandated reporters become aware of their legal obligations regarding the reporting of abuse and neglect. This article is designed to serve as a dental team in-service training program for the detection and reporting of child abuse and neglect. Many of the concepts discussed can be applied to the other forms of family violence.

AUTHORS

**Kathleen A. Shanel-Hogan, DDS,** is a consultant, educator, and facilitator for family violence prevention and serves on the Board of Directors of Prevent Child Abuse-California.

**Julie A. Jarrett, RDA, BS,** is coordinator of CDA's Council on Community Health.

Child abuse and neglect are components of the cycle of family violence, which is not age-specific. Violence in the family can occur with children, adults, and elders. Often a family with one component of violence will have the strong possibility for other forms. As mandated reporters in California, health professionals have the responsibility of reporting suspected child abuse and neglect, elder abuse and neglect, and domestic violence where physical assault has occurred. A child is defined as a person under the age of 18. In addition to the child abuse reporting law requirement, health practitioners must also report cases of abuse of individuals 65 years of age or older (Welfare and Institutions Code 15610[a]) or individuals between the ages of 18 and 64 whose physical or mental limitations restrict their abilities to protect their own rights (W&IC 15616 [b] [1]). Many of the laws that pertain to abuse and neglect can be located in either the W&IC or the California Penal Code (CPC).

By taking a proactive role in the detection and reporting of child abuse and neglect, dental mandated reporters may save the lives of young victims and assist agencies in helping families in the community. The California Dental Association's Council on Community Health encourages dental team members to participate in a mandated reporter training program that provides information on how to detect and report child abuse and neglect, elder abuse and neglect, and domestic violence.

CDA JOURNAL, VOL 27, Nº11

Dentists, registered dental hygienists, and registered dental assistants are designated by law as mandated reporters and are required to report suspected cases of abuse and neglect while in their professional capacities.

Consider for a moment the following scenario: a young boy is waiting for an emergency examination for a fractured tooth and is accompanied by his mother. The boy is wearing a turtleneck with long pants. His appearance is neat but his attire seems odd since the temperature outside is 98 degrees. He walks guardedly to the operatory and sits tentatively in the dental chair. As the exam begins, a dental team member notices a series of varying colored bruises on the boy's wrists. In addition, there is a bruise on his right cheek directly over the fractured first molar. As a mandated reporter, a dentist thinks he or she may need to file a report of suspected child abuse but is unsure of who to call and what information must be provided. Now what?

## Using This Article in the Dental Practice

It is vitally important that mandated reporters become aware of their legal obligations regarding the reporting of abuse and neglect. This article is designed to serve as a dental team in-service training program for the detection and reporting of child abuse and neglect. Many of the concepts discussed can be applied to the other forms of family violence.

It is suggested that a team leader utilize this article in conducting a team meeting to apprise staff of their legal obligations regarding the reporting of child abuse and neglect. Making a report of suspected child abuse is difficult. There are always nagging doubts about how the parents will react, what the outcome will be, and whether the report will put the child in greater risk.[1]

The best way to minimize the difficulty of reporting is to be fully prepared for the experience and to feel reasonably comfortable with the reporting requirements and the process that is triggered by making a report.[1] Some questions that will be answered in this in-service training program include: If I suspect abuse do I need to report it? Who do I report to? Do I have to provide my name? Am I legally protected? What could happen if I don't report? In addition to this article, there are excellent resources available (**Table 1**). Of particular note for California are the first four booklets and the Internet address for California Law listed under "Publications and Articles."

## Child Abuse and Neglect Reporting Law

A Prevent Abuse and Neglect through Dental Awareness (P.A.N.D.A.) survey conducted in 1995 revealed that most California dental professionals responding to the survey were familiar with the signs and symptoms of child abuse and neglect but were inconsistently aware of the legal responsibilities for mandated reporting.[2]

The first step in becoming aware of one's obligations regarding the reporting of child abuse and neglect starts with understanding the law. This article provides three forms, Reporter Responsibility and Sample Employee Form (**Figure 1**), Child Abuse Reporting Requirements Employee Acknowledgment Form (**Figure 2**), and Suspected Child Abuse Form SS8572 (**Figure 3**) to encapsulate information to assist the dental office in educating its team. (The official form is printed on four-part NCR paper. This copy is provided for use only as a "working copy" and is not to be submitted to any agencies.)

**Figures 1 and 2** are currently used as employee statements acknowledging mandated reporter responsibility in California. **Figure 1** is from the California Department of Social Services Office of Child Abuse Prevention. The benefit of this form for the dental office is the ease of training new employees in the responsibilities of being a mandated reporter by reviewing the printed information. **Figure 2** is from the California Medical Association. The strength of this form is the reproduction of Section CPC 11166.5 of the Child Abuse and Neglect Reporting Act, which identifies what provisions must be in the employee statement. It also provides greater definition of who is identified as a mandated reporter in California. By using both forms, in combination, the employer can provide education for the mandated reporters on staff and meet the intent of the California law. It is suggested that the mandated reporter employee sign both forms.

Any person entering employment that makes him or her a mandated reporter must sign a statement, provided and retained by the employer, to the effect that he or she has knowledge of the reporting law and will comply with its provisions (CPC 11166.5[a]). Most employers are unaware that any dentist, registered dental hygienist, or registered dental assistant whom they employ must sign a statement acknowledging mandated reporter responsibilities. At the conclusion of a team meeting, the employer should provide a copy of both forms to each mandated reporter. The forms should be signed and dated with the employing dentist or supervisor serving as the "Witness." The originals should then be placed in the employee's personnel file, with copies being provided to the employee.

To assist employers in fulfilling their legal obligations, this article will discuss

**TABLE 1.** Resources

There are many excellent resources that can assist the dental team in learning more about child abuse and neglect identification, reporting and prevention. The following resources, while not inclusive, are provided to act as a springboard to other sources. All viewpoints expressed by each resource are not necessarily the opinion of the authors of this article or those of the CDA Council on Community Health; but the information provides excellent illustration, perspective, and food for thought.

## Agencies and Associations

**California Dental Association**
1201 K St.
P.O. Box 13749
Sacramento, CA 95853
(800) 736-7071, Ext.4350
www.cda.org/public/index

**Office of Child Abuse Prevention**
744 P St., MS 19-82
Sacramento, CA 95814
(916) 445-2771
www.dss.cahwnet.gov/getser/cfsocap.html
www.childsworld.org/

**California Office of the Attorney General**
**Crime and Violence Prevention Center**
P.O. Box 944255, Suite 1150
Sacramento, CA 94244-2550
(916) 324-7863
(916) 327-2384 (fax)
http://caag.state.ca.us/cvpc

**Prevent Child Abuse -- California**
(Formerly named California Consortium to Prevent Child Abuse)
926 J St., Suite 717
Sacramento, CA 95814
1 (800) CHILDREN (California only)
(916) 498-8481
www.pca-ca.org

**Prevent Child Abuse -- America**
(Formerly named National Committee to Prevent Child Abuse)
P.O. Box 2866
Chicago, IL 60690-9950
(312) 663-3520
www.childabuse.org

## BOOKS

Barnett OL, Miller-Perrin CL, Perrin RD, Family Violence Across the Lifespan. Sage Publications, Thousand Oaks, Calif, 1997.

Besharov DJ, Recognizing Child Abuse, A Guide for the Concerned. The Free Press, New York, NY, 1990.

Besharov DJ, Recognizing Child Abuse, The Trainer's Manual. (1998 California Adaptation, available from Prevent Child Abuse-California, Sacramento, Calif.)

Helfer ME, Kempe RS, Krugman RD, The Battered Child, 5th ed. The University of Chicago Press, Chicago, Ill, 1997.

Hobbs CJ, Hanks HG, Wynne JM, Child Abuse and Neglect, A Clinician's Handbook, 2nd ed. Churchill Livingstone, London, 1999.

Hobbs CJ, Wynne JM, Physical Signs of Child Abuse - A Color Atlas. WB Saunders Co Ltd, London, 1999.

Iwaniec D, The Emotionally Abused and Neglected Child. John Wiley and Sons, Chichester, England, 1995.

Monteleone JA, Child Maltreatment, A Comprehensive Photographic Reference Identifying Potential Child Abuse. GW Medical Publishing, Inc, St Louis, 1994.

Monteleone JA, Recognition of Child Abuse for the Mandated Reporter. GW Medical Publishing, Inc, St Louis, 1994.

Monteleone JA, Brodeur AE, Child Maltreatment, A Clinical Guide and Reference. GW Medical Publishing, Inc, St Louis, 1994.

Myers JE, Legal Issues in Child Abuse and Neglect Practice, 2nd ed. Sage Publications, Thousand Oaks, Calif, 1998.

## PUBLICATIONS AND ARTICLES

The California Child Abuse and Neglect Reporting Law: Issues and Answers for Health Practitioners, Publication 132 (4-91). California Department of Social Services, Office of Child Abuse Prevention. (New edition to be released soon)

Child Abuse, Educator's Responsibilities, Publication D1-7020, 4th ed. California Office of the Attorney General, Crime and Violence Prevention Center, August 1999.

Child Abuse and Neglect Reporting Act (California Penal Code Section 11164-11174.3) To access California Law and California Penal Code section through the Internet, go to www.leginfo.ca.gov/calaw.html

The Child Abuse Prevention Handbook, California Office of the Attorney General, Crime and Violence Prevention Center (New edition to be released soon)

Abuse Detection and Education --Train the Trainer Resource Guide. CDA Council on Community Health, Sacramento, Calif, 1998.

American Dental Association, The Dentist's Responsibility in Identifying and Reporting Child Abuse and Neglect, 3rd ed. American Dental Association, Chicago, 1995.

American Dental Association, 1994 Survey of Current Issues in Dentistry: Dentists' Efforts to Identify and Prevent Child Abuse. American Dental Association, Chicago, 1996.

Blain SM, Abuse and neglect. J Cal Dent Assoc, 19(9): 16-24, 1991. California Medical Association, California Physician's Legal Handbook, 1999, Vol. 3, Section 34:6.

Kessler DB, Hyden P, Physical, sexual, and emotional abuse of children. Clin Symp, 43(1):1-32, 1991.

Mouden LD, The role for dental professionals in preventing child abuse and neglect. J Cal Dent Assoc, 26(10):737-43, 1998.

Spencer DE, Bitemarks in child abuse. In, Manual of Forensic Odontology, 3rd ed. Printing Specialists, Montpelier, Vt, 1995, pp 177-8.

Spencer DE, Recognizing and reporting child abuse. J Calif Dent Assoc 24(5):43-9, 1996. Sperber ND, The dual responsibility of dentistry in child abuse. J Calif Dent Assoc, 8(3):31-8. 1980.

in detail the Reporter Responsibility and Sample Employee Form that details the California Child Abuse and Neglect Reporting Act. Throughout this discussion, the term abuse pertains to both abuse and neglect. The following is a detailed description of each section of the form and how it relates to the practice of dentistry.

## Definitions

Definitions cover two important aspects of the law. First are the types of abuse that are reportable. To better understand what each of the reportable conditions entails, it is recommended that mandated reporters attend a training session or conduct further research into the clinical aspects of abuse. A list of resources (**Table 1**) is included. For example, what are the signs of abuse? Becoming familiar with the types of abuse will greatly assist a mandated reporter in determining if an abuse report needs to be filed. Physical abuse is described as a physical injury inflicted by other than accidental means on a child (CPC 11165.6). Child sexual abuse includes both sexual assault and sexual exploitation. Sexual assault includes sex acts with children, intentional masturbation in the presence of children, and child molestation. Sexual exploitation includes preparing, selling, or distributing pornographic materials involving children, performances involving obscene sexual conduct, and child prostitution (CPC 11165.1).

Neglect of a child, whether "severe" or "general," must also be reported if the perpetrator is a person responsible for the child's welfare. It includes acts or omissions harming or threatening to harm the child's health or welfare (CPC 11165.2). Unlawful corporal punishment or injury is described as a willfully inflicted injury, resulting in a traumatic condition (CPC 11165.4). Willful cruelty or unjustified punishment includes inflicting or permitting unjustifiable physical pain or mental suffering or the endangerment of the child's person or health (CPC 11166[b]). "Mental suffering" in and of itself is not required to be reported. However, it may be reported (CPC 11166[b]).

The second important aspect of the law is who is mandated to report. In the dental practice, dentists, registered dental hygienists, and registered dental assistants fall within the category of "health practitioner" and are thus mandated to report suspected child abuse as defined in CPC 11165.6.

### *Reporting*

This form (**Figure 1**) is an excellent summary tool for understanding when and to whom to report. Again it is important that mandated reporters become familiar with the process of reporting long before they are faced with a suspicion of abuse. "Reasonable suspicion" occurs when "it is objectively reasonable for a person to entertain such a suspicion, based upon facts that could cause a reasonable person in a like position, drawing when appropriate on his or her training and experience, to suspect child abuse" (CPC 11166[a]). Although wordy, the intent of this definition is clear: if you suspect, report.[3]

When a child is present in the dental practice and there is reasonable suspicion of abuse, a mandated reporter is required by law to contact (via phone) a child protective agency immediately or as soon as reasonably possible (CPC 11166[a]). The phone number for Child Protective Services (CPS) in each area can be located in the county listing of the telephone directory white pages. If a person is witnessing the abuse actually being perpetrated and a child's life may be in danger, local law enforcement may be the best way to report. Local law enforcement can be contact via telephone by dialing 911. It is recommended that mandated reporters check with their local CPS agency to determine their county's preferred protocol.

Once a verbal report is received, the Suspected Child Abuse Report Form SS8572 (an unofficial example that may be used as a working copy appears as **Figure 3**) must be completed and returned within 36 hours of the initial telephone report (CPC 11166[a]). The report form is available from local child protective agencies such as CPS (CPC 11168). Form SS8572 may also be requested directly from the Department of Justice through the following address: California Department of Justice, Bureau of Criminal Identification and Information, P.O. Box 90317, Sacramento, CA 94203-4170. The best preparation is to obtain the forms in advance and have them on file. Further discussion of this form is included in a subsequent section of this article.

Often the dental team works together to determine if reasonable suspicion exists. When a report needs to be filed, only one mandated reporter needs to file the report on behalf of the team. If the designated person fails to report, then the mandated reporter has the responsibility to follow-up and report. When a report is made, the mandated reporter is required by law to provide his or her name since it validates that he or she has fulfilled the legal obligation to report. CPS is required to keep the mandated reporter's name confidential and disclose it only to child protective agencies and entities identified in CPC 11167.

### *Legal*

There are many aspects of California law that protect a mandated reporter.

Immunity from criminal and civil liability is provided to the mandated reporter when a report is filed (CPC 11172[a]). If a civil suit is filed against a mandated reporter, the state will reimburse for legal fees incurred in the suit up to $50,000. (CPC 11172[c]). In addition, no mandated reporter can be dismissed, disciplined, or harassed for making a suspected child abuse report (CPC 11166[h]). However, if a mandated reporter refuses to report suspected abuse, he or she becomes criminally liable. Refusal to report is considered a misdemeanor and is punishable by up to six months in county jail and a fine of not more than $1,000, or both (CPC 11172[e]).

Mandated reporters are not legally obligated to notify the parents or care providers that a report is being filed. One should keep in mind that parents are not always the perpetrators in an abuse case and may not be aware that their child exhibits signs of abuse. Abusers can include other family members, childcare providers, neighbors, etc., so discussing the suspicions in a nonjudgmental fashion with the parents or care provider may be beneficial. The current Child Abuse and Neglect Reporting Act, which is contained within the California Penal Code at sections 11164-11174.3, can be acquired by accessing the Internet site titled California Law at www.leginfo.ca.gov/calaw.html.

## Suspected Child Abuse Report Form

The Suspected Child Abuse Form SS8572 is one of the appropriate forms to report child abuse and neglect. The second is the Medical Report-Suspected Child Abuse Form DOJ 900. The latter form is two pages and is designed more for hospitals, physicians, and full-body examinations. The Form SS8572 is a single-page report form and the one most utilized by dental professional mandated reporters. This article discusses the components of the single-page form.

After presenting mandated reporter workshops throughout California since 1994, Dr. Shanel-Hogan has had the opportunity to speak to many individuals involved in CDA, Prevent Child Abuse-California, CPS, California Department of Social Services Office of Child Abuse Prevention, local child abuse prevention councils, California Department of Justice Office of Attorney General, and district attorneys. People have shared ways to increase the effectiveness of the Suspected Child Abuse Report Form SS8572. The following ideas and suggestions are accumulated from personal experience and five years of her working with the above organizations and agencies.

When suspicion of child abuse and/or neglect arises, there is often concern about how to make the report. By using a copy of the actual form to collect the information in an organized manner, it will be easier and less stressful on the mandated reporter. The individual at CPS will be asking for the information as if it were coming right from the form. If the mandated reporter responds to clarifying inquiries of the CPS caseworker, the information provided can be noted on the copy of the form. This document then becomes the "working draft" of the report. It becomes much simpler to transfer information from the "working draft" to the formal report.

The Suspected Child Abuse Report Form SS8572 will now be discussed section by section. This method of review can be very helpful in explaining to the team how to make an effective and objective report. The italicized statements are printed on the reverse of the single-page Form SS8572.

### *Section A. Case Identification*

*Enter the victim name, report number or case name, and date of report.*

This section is to be completed by the investigating child protective agency. However, a case number or an identification number will be assigned to the report. For follow-up purposes, the mandated reporter should ask for this number and the name of the intake worker taking the report. The name of the intake worker should also be recorded in Section C. Counties may provide follow-up by letter or telephone. Upon completion of the investigation or after there is a final disposition of the matter, the investigating agency shall inform the mandated reporter of results and actions taken (CPC 11170[b]2). If the reporter has not heard from the agency after a while, he or she should call the agency and inquire. Due to confidentiality of the investigation process, the mandated reporter may at times only be informed of the case status as unfounded, substantiated, or inconclusive.

These terms are defined in Section 11165.12 of the CPC "Unfounded" means a report that is determined by a child protective agency investigator to be false, to be inherently improbable, to involve an accidental injury, or not to constitute child abuse or neglect, as defined in Section 11165.6. "Substantiated" means a report that is determined by a child protective agency investigator, based on some credible evidence, to constitute child abuse or neglect as defined in Section 11165.6. "Inconclusive" means a report that is determined by a child protective agency investigator not to be unfounded, but the findings are inconclusive and there is insufficient evidence to determine whether child abuse or neglect, as defined in Section 11165.6, has occurred.

### *Section B. Reporting Party*

*Enter your name/title, address, phone number, date of report, and signature.*

This section appears very straightforward. It is important that the name of the mandated reporter making the report is entered. The address listed should be where the investigating agency can contact the mandated reporter in case of need for further information and follow-up. It is suggested that the reporter's work address be listed here. In the rare occasions of court prosecution, the address could be released to the court. Most mandated reporters feel more comfortable with the work address being listed. The date of the report is the date the report is filled out. The date the initial call is made is placed in Section C.

### *Section C. Report Sent To*

*(1) Check the appropriate box to indicate which child protective agency (CPA) this report is being sent; (2) Enter the name and address of the CPA to which this report is being sent; and (3) Enter the names of the official contacted at the CPA, phone number, and date/time contacted.*

This reporting form may be used to submit suspected child abuse and neglect mandated reports to any of the agencies listed in Section C. When one is making a report, he or she should ask the intake caseworker to indicate which box should be checked. In most counties, suspected child abuse and neglect reports are made to CPS. However, if the mandated reporter is witnessing the abuse taking place and the person is in immediate danger, the reporter should call 911. The report is then made to local law enforcement. The best way to be sure of the local protocol for making a report is to contact the local CPS office in the county listing of the telephone directory white pages. This will allow the reporter to determine the appropriate way to make an effective report for the county by accessing the established system and to build collaborative communication links. The various child protective agencies communicate through the sharing of reports. Since the reporter will be retaining a copy of the filed report, the information regarding the contact person will assist in requesting report follow-up.

### *Section D. Involved Parties*

There are three subsections to Section D.

*a. Victim: Enter the name, address, physical data, present location, and phone number where victim is located (attach additional sheets if multiple victims).*

An important component of this section is to identify the present location of the child. For example, if the child is at school, identify the school. CPS encourages reporters -- if the determination of suspicion is made on a school day -- to make the report as early in the day as possible. This will allow CPS the ability to contact the child at the school during school hours. A report on Friday at 3:30 p.m. may make it more difficult to locate the child.

Also the indication of the sex of the child is important. Some names do not readily identify the child's sex. For example, names such as Pat and Chris in addition to other culture-specific names could be misleading.

*b. Siblings: enter the name and physical data of siblings living in the same household as the victim.*

If the reporter is knowledgeable about siblings of the victim, he or she should indicate the information requested. This information will assist CPS in evaluating the risk situation. There may be previously filed reports regarding the other children. This information can facilitate cross-reference. If there is the potential of drugs or weapons involved, CPS will be better prepared to assist all the children in the environment. Mandated reporters are often unaware of what has been previously reported or what investigations are in progress. The information provided by a mandated reporter may seem insignificant, but it may be the powerful missing piece of information or linkage that will assist the child protective agency in breaking the cycle of child abuse.

*c. Parents: Enter the names, physical data, addresses, and phone numbers of father/stepfather and mother/stepmother.*

Often, dental offices will have information on the parents of the child, especially when it relates to dental insurance coverage. In the extended families of divorce and separation, dental office information may be more current than other sources. This form does not have a place to indicate which parent(s) the child resides with, so one should indicate this information in this section if known.

### *E. Incident Information*

*(1) Enter the date/time and place the incident occurred or was observed, and check the appropriate boxes; (2) Check the type of abuse; (3) Describe injury or sexual assault (where appropriate, attach Medical Report - Suspected Child Abuse Form DOJ 900 or any other form desired); (4) Summarize what the child or person accompanying the child said happened; and (5) Explain any known prior incidents involving the victim.*

This is the section where information that has been gathered will be objectively reported. This is why the mandated reporter suspected child abuse report is a report and not an accusation. Investigation will be handled by the appropriate agency. As mandated reporters, dental professionals work

collaboratively with the agencies to assist families. In the process of collecting data and information for differential diagnosis of dental/medical problems, red flag suspicions of child abuse and neglect maybe raised. The ability to collect nonjudgmental observations greatly assists the efforts to help children and families. If there is the potential of drugs or weapons involved, this should be indicated on the report. This will assist CPS in determining the appropriate participation in the response and investigation.

Section E begins with a small line saying "If necessary, attach extra sheet or other form and check this box." To establish the presence of additional documentation attached to the report form, it is imperative that this box be checked. If it is not, the admission of any information provided on attached documentation could be disqualified in the off chance of litigation. Form SS8572 is a four-page NCR document. It should be filled out with a ballpoint pen utilizing legible handwriting and pressing hard or with a typewriter. Upon arrival at CPS, the report form will be separated and each page sent to a different agency. Therefore, it is suggested that four copies be made of any additional documentation being attached to the report to expedite the processing. The mandated reporter's copy is the last NCR page. A prudent mandated reporter will make a photocopy of the front of the report and any additional documentation and attach it to the retained yellow copy of the form. This will facilitate easier reading of the report later.

The information in Box 1 of Section E should be answered to the best of the mandated reporter's ability. But this does not mean that the mandated reporter should interrogate the child or accompanying person to gather information. This is when the need to gather data for diagnostic purposes crosses the line into investigation. For the sake of court-admissible data, it is important for the responsible authorities to collect this data which will then become evidence.

The boxes identifying if the child is in out-of-home care is important because it will assist in directing where the report should be additionally sent. The licensing agencies have a responsibility for being aware of potential violations of child abuse and neglect.

Box 2 requests that the mandated reporter identify the type of abuse. The request is for what is recognized and does not exclude the presence of other forms of abuse that have not been revealed to the mandated reporter.

Box 3 is the location to provide a narrative description of the abuse or neglect observed by the mandated reporter. Record location, size, color, pattern, and shape of presented abuse or neglect signs and symptoms. Use diagrams, radiographs, and/or photographs to illustrate observations if necessary. Photographs and radiographs may be taken of children in the cases of suspected child abuse and neglect without parental permission (CPC 11172 [a]) and (CPC 11171 [a]). Suggestions for taking photographs are included in one of the listed resources.4 If additional documentation is attached, the box in Section E should be checked to indicate that this is the case.

It is key that the mandated reporter remember that the report is an account of observations to authorities and not an accusation. The report form is considered a legal document. The mandated reporter should refrain from offering opinions and conclusions. When faced with the suspicion of abuse or neglect, a normal human response is to experience strong emotions and feelings. A person may feel angry and upset, but it is important that the emotion remain out of the report. The report most effective for assisting child protective agencies is the objective report that communicates observations and accurately relates verbal information. The responsibility of the mandated reporter is to report child abuse and neglect, not to be an investigator.

Box 4 is the location to provide a summary of what the abused child or person accompanying the child said. Direct quotes included in the report by the mandated reporter can be critically important. For example, a mother states the following regarding the patterned mark on her daughter's cheek: "Her father hit her with a wire brush." The appropriate way to objectively report this example would be to describe the patterned mark in Box 3 and quote the mother directly in Box 4. The following language is suggested: "The mother stated, 'Her father hit her with a wire brush.'" The reporter should avoid summarizing the statement as in "The father hit the daughter with a wire brush" without identifying who made the statement. It is important that the mandated reporter not offer opinions or conclusions in the report. This maintains the report language as an observation and not an accusation.

Box 5 is the location to "explain known history of similar incident(s) for this child." This is the location to identify past patterns and occurrences that have been observed. Descriptions, dates, and reasons for the injuries or circumstances can be provided here. Previous reports made can be documented here to assist in cross-referencing of reports.

CDA JOURNAL, VOL 27, Nº11

## Organized Dentistry's Efforts to Answer the Cry for Help

The California Dental Association has been a proactive coalition partner against child abuse since 1994 when Delta Dental Plan of California introduced the California P.A.N.D.A. program. P.A.N.D.A. is an educational program coordinated through the efforts of a coalition of organizations that are associated with the dental profession and those directly involved in the prevention of child abuse and neglect. The goal of the P.A.N.D.A. program is to provide education to dental professionals on how to recognize and report suspected cases of child abuse and neglect and to promote awareness of child abuse prevention. The P.A.N.D.A. name was conceived by Delta Dental Plan of Missouri, which began a similar program in 1992.5 The California P.A.N.D.A. Coalition can be credited with training more than 5,500 dental professionals from 1994 to 1997 on how to detect and report child abuse and neglect.

CDA accepted the transfer of the administrative and financial responsibility of the P.A.N.D.A. program from Delta Dental in 1997. The association's Council on Community Health saw this as a significant opportunity not only to become the new sponsor of the P.A.N.D.A. program but also to incorporate P.A.N.D.A. into a larger, more comprehensive abuse detection and reporting program. In 1998, the Council on Community Health launched its Abuse Detection and Education Program encompassing the detection and reporting of child abuse and neglect, elder abuse and neglect, and domestic violence. The current CDA web page includes narrative materials on child abuse and neglect and elder abuse and neglect. Since the program's inception, the council has provided mandated reporter training on all forms of abuse and neglect to more than 4,300 dental health care providers. In addition, it has sponsored four continuing education presentations at CDA Scientific Sessions and a statewide abuse detection and education conference.

Through ongoing mandated reporter train-the-trainer seminars, the council would like to have mandated reporter trainers in each of the association's 32 local components. In addition it would like to have trainers in each of the California dental hygiene programs, registered dental assisting programs, and five dental schools. This would greatly assist with the education of mandated reporters and contribute to the collaborative effort within the community to prevent abuse and neglect.

## Community Capacity

The effect of the P.A.N.D.A. program has been far-reaching. Dental professionals have been trained through the seminars at CDA Scientific Sessions, local dental societies, dental schools, and dental hygiene and dental assisting schools. More people were reached through mailing of materials and videos. As awareness grew of CDA's program, requests for information and seminars increased. The Abuse Detection and Education Program materials have been distributed, discussed, and/or presented to Headstart groups, the University of California Davis Medical Center Child Protection Center, Americorps, family support workers, district attorneys, State Conference of Child Abuse Prevention Council executive directors, regional child abuse prevention council leadership conferences, the California School-Age Consortium Statewide Conference, Interfaith leadership, CPS agencies, the California Youth Authority, and others. The effect of this program crosses dental lines to include the rest of the community.

Dentistry is well-respected in the child abuse prevention field for its awareness and focused interest in working collaboratively with other agencies in the field of child abuse and neglect prevention. It is through this combined communication and collaboration that community capacity can be fostered and built. Community capacity encompasses the community's ability to cooperatively work together on a common goal, which in this case is the prevention of child abuse and neglect.

Involvement of dental professionals in the community effort to foster change in family violence can make a difference. Sixty-five percent of child abuse and neglect is physically manifested in the head and neck region. Dental professionals have the challenge to increase the awareness of how to detect abuse, especially oral abuse, and to join the community effort. Community capacity to prevent abuse and neglect depends on the communication and collaboration of the entire community.

So, now that the dental team has been trained, what else can a dentist do? A dentist can contact CDA and become a trainer of mandated reporters for his or her community. He or she can contact the local Child Abuse Prevention Council and ask how to join the community's effort to prevent child abuse and neglect and assist in building community capacity.

This is a great opportunity for dentistry to be passionately involved in communities. The effect will be to positively affect children and their families. The victims of abuse often speak in nonverbal language through signs and symptoms. Dental professionals have the opportunity to become their voice. Dentistry can make a difference. Now is the time.

References
1. The California Child Abuse and Neglect Reporting Law: Issues and Answers for Health Practitioners, Publication 132(4-91), p 1.
2. Ramos-Gomez F, Rothman D, Blain S, Knowledge and attitudes among California dental care providers regarding child abuse and neglect. *J Am Dent Assoc* 129: 340-8, 1998.
3. The California Child Abuse and Neglect Reporting Law: Issues and Answers for Health Practitioners, Publication 132(4-91), pp 4-5.
4. Spencer DE, Recognizing and reporting child abuse. *J Calif Dent Assoc* 24(5):43-9, 1996.
5. P.A.N.D.A. Program promotional brochure, The P.A.N.D.A. Coalition, 1996.
6. The California Child Abuse and Neglect Reporting Law: Issues and Answers for Health Practitioners, Publication 132(4-91), p. 23.
7. California Medical Association's California Physician's Legal Handbook (1999), Vol 3:34:6.
8. Department of Justice Form SS 8572 (Rev. 1/93).
To request a printed copy of this article, please contact/ Julie Jarrett, RDA, BS, California Dental Association, 1201 K St., Sacramento, CA 95814.

CDA JOURNAL, VOL 27, Nº11

# Franchot Nuedelman

Robert E. Horseman, DDS

Franchot Nuedelman was in the other day. He's a little guy, wispy white hair, wouldn't top 110 soaking wet. You remember, I told you about Nuedelman, the old party who always comes in with a newspaper folded several times so that the crossword puzzle he has under construction will be readily available in case there's a lapse in the conversation. This is not likely since he and I claim the same generation and any treatment he receives must be prefaced by a 20-minute litany of bodily malfunctions we have in common. He and his wife, Hyacinth, have been patients of mine for years, the two of them constituting a walking museum of just about everything dentistry has to offer.

We engage in the obligatory retrospective of our past and current geriatric woes, during which my 23-year-old assistant slumps on her stool, eyes rolling. She's heard all this before.

"What can I do for you today, Franny?" I offer finally.

"Another one of your fillings fell out," he sighs, like this was a weekly occurrence. "What's an 11-letter word for 'lacking the qualities for effective action'?"

"Incompetent?" I suggest.

"Right!" he chuckles.

I like older patients as a rule. They are direct, if not downright blunt, know what they want and are usually a little less critical of my work than I am. Nuedelman hasn't had a carious tooth for years. For one thing, he smokes a pipe whose by-products of combustion are a more potent antibacterial agent than anything developed by the entire pharmaceutical community in the past 75 years. For another, everything that's likely to decay has already done so and been restored with whatever was in vogue at the time.

He carefully rummages through his pockets to retrieve a small packet made of folded Kleenex wrapped in Scotch tape. "This it?" I ask as he carefully passes it to me like it was the Hope diamond.

"Yep. Saved it so you could paste it back in."

It is the entire buccal of No. 14, fractured off about a half millimeter below the gingival. I poke the intraoral camera in his mouth and fix the image of the upper left first molar up on the screen. The MOD amalgam is still there, clinging precariously to the lingual walls. "See, Franny, your filling is still there; you've lost a big chunk of your tooth." Hard to keep the triumph out of my voice. He pushes his trifocals up from the tip of his nose and peers at the monitor with wooden incomprehension.

"Not your filling?"

"No, your tooth." I need to establish whose what is whose. "It's gonna need a crown to save it."

"Suppose that'll run, what, a couple

CDA JOURNAL, VOL 27, Nº11

hunnert bucks?"

"More like $600."

"Doc, I'm 82 already. Pull it out. I won't be around long enough to pay for it."

It doesn't rank among the dizzier flights of the human imagination to appreciate Nuedelman's position. This is the downside of treating old people. Many of them recognize that, actuarially speaking, the numbers are not going to keep accumulating indefinitely, and their logic is irrefutable. No sense mentioning No. 14 might also need a root canal treatment at another $800 or so. Forget the whole implant option, the zillion dollars worth of equipment and supplies to accomplish the miracles of modern dentistry. I might as well try to sell him on the concept of goat gland extracts at some rejuvenation clinic in Switzerland. A tsunami of internal marketing would wash over Nuedelman with negative results. In the absence of infection, I make peace with my conscience.

"Fran, does this tooth hurt?"

"No, but I'm fixin' to wear my tongue out on the edge of it."

"How about if I try building up the missing part with some stuff that kind of bonds to the tooth and old filling? Might last a couple years."

"Stuff" and "bond" share a common understanding in our mature lexicons.

"Long enough," he agrees.

The job is done, I show him the tooth on the monitor. It looks good, the prognosis doubtful. I explain. "What do you think?"

"About what?" He's anxious to get back to his crossword.

"Your tooth, the thing we just did, remember?"

He cranes his neck at the screen. "Better'n I could do," he ventures after a moment, returning to his puzzle. "What's German for 'thanks' -- five letters?"

"Danke."

"You're welcome," he smiles, wets the tip of his pencil and painstakingly blocks in the letters.

Takes him 10 minutes to gain the front door with his walker.

"Senior discount?" he says to Mary.

"The usual," she affirms.

He turns to me as he passes out the door. "Doc, you're the best!"

"I know, Franny, so are you. Lose the pipe, OK?"

"Sure, Doc. See you when another one of your fillings falls out."

"I'll be here," I promise. And I hope I am. I hope we both are.