Creating a New Generation of Pediatric Dentists: A Paradigm Shift in Training

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Abstract: The University of California, Los Angeles (UCLA) School of Dentistry has implemented a Health Resources and Services Administration-funded program to prepare dentists for the complex and comprehensive needs of pediatric patients within rapidly changing demographics and a paradigm shift in dentistry. Traditional dental education has focused on how to respond to oral disease, whereas UCLA's program shifts the paradigm to emphasize early assessment, risk-based prevention, and disease management. A holistic approach to dental care that considers social and environmental determinants is used with minimally invasive techniques for restorative care. To support this change, pediatric dental residents receive traditional training combined with new didactics, advocacy opportunities, and applied learning experiences at community-based organizations. These new elements teach residents to recognize the causal factors of disease and to identify interventions that promote oral health at the individual, family, community, and policy level. Consequently, they are better prepared to treat a diverse group of patients who historically have faced the greatest burden of disease as well as an increased number of barriers to accessing oral health care; these consist of low-income, minority, and/or pediatric populations including children with special health needs. The program's ultimate goal is for residents to deploy these skills in treating vulnerable populations and to demonstrate greater interest in collaborating with non-dental health providers and community organizations to increase access to dental services in private or public health practice settings.

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The education of today's dentists emphasizes proficiency in the restoration of oral health through surgical treatment of the consequences of disease. As a result, many clinicians demonstrate a less-than-optimal understanding of preventive care, early diagnosis, and disease management. Their focus is often limited to diagnosing symptoms and clinical conditions without considering contextual (nonclinical) risk factors or the use of minimally invasive preventive intervention. This is in direct contrast to the Institute of Medicine (IOM) approach, which emphasizes a systemic approach to improving oral health through greater prevention and disease management, oral health literacy, surveillance of oral health care, research to improve the evidence base for interventions, cultural competence, and infrastructure improvement.[1] Furthermore, current Commission on Dental Accreditation (CODA) standards for pre- and postdoctoral dental programs did not generally align with the IOM's recommendations prior to 2013.[2,3] Overall, only a small portion of current dental education curricula is devoted to prevention and public health.[4] Instead, predoctoral D.D.S. or D.M.D. programs focus on the biomedical, behavioral, and clinical sciences, practice management, ethics and professionalism, information management, and critical thinking.[3] Most postdoctoral, advanced/specialty, and clinical fellowship programs

also lack a strong focus on the IOM recommendations, instead giving prominence to the treatment of problems caused by disease progression within specific areas of dentistry.

Closing the gap between traditional dental education programs and the IOM-recommended methodology will require a new emphasis on early diagnosis, individual-centered treatment planning, and disease management. This effort will need to consider a broader range of cultural, environmental, and contextual factors that have been shown to influence oral health and risk for dental disease.[5] As one way of addressing that need, the aim of this article is to describe the University of California, Los Angeles (UCLA) School of Dentistry's program to prepare pediatric dentists for the complex and comprehensive needs of pediatric patients within rapidly changing demographics and a paradigm shift in dentistry.

Program Design and Implementation

Established in 1960, the UCLA School of Dentistry is dedicated to improving oral health through teaching, scholarship, and public service. For over fifty years, the school has graduated general dentists and specialists qualified to treat a wide range of patients and conditions, while adhering to all CODA standards. The Community Health and Advocacy Training in Pediatric Dentistry (CHAT-PD) program was created to further enhance graduates' skills. This postdoctoral dental training program is modeled on the UCLA School of Medicine's Community Health and Advocacy Training (CHAT) pediatric residency program, which aims to prepare specially trained residents to improve children's health by promotion of health and development and prevention of disease within the context of family and community.[6] CHAT-PD shares these goals and incorporates a strong focus on integrating oral and general health through interprofessional education and collaboration. CHAT-PD also offers a dual-degree program with the UCLA School of Public Health for residents to concurrently earn a Master's of Public Health. Longer range plans for the program include expansion to other educational tracks, including general dentistry and other areas of medicine, such as pediatrics and nursing.

The primary objective of CHAT-PD has been the development and implementation of a postdoctoral program that trains pediatric dental residents to have an impact beyond the customary dental office setting. Conventional components certify that residents are proficiently trained to provide comprehensive oral health care to infants and children through adolescence, following the life course model used by the Maternal and Child Health Bureau.[7] However, CHAT-PD provides supplemental integrated coursework, policy and advocacy opportunities, and applied learning experiences that encourage a focus on treating the patient holistically and within the context of specific regional and demographic influences.

During the creation of CHAT-PD, educational components that have not customarily been emphasized or included in pediatric residency programs were considered. This was to ensure that graduates understand how to incorporate individual, family, community, and system-based approaches into their dental practices. The result is a program designed to infuse additional learning experiences into the pediatric dental residency curriculum through academic courses, clinical training, applied learning experiences, and research. These components permit residents to learn a series of new skills through their coursework while providing opportunities to extend those skills through clinical training, applied learning experiences, and practical activities.

Effective July 2013, CODA standards[2,3] require that dental education programs contain community-based learning, following calls from the IOM[1] and U.S. surgeon general,[8] among others. While accreditation standards are a good start for addressing pervasive needs, more emphasis must be placed on foundational didactic components as well. This means incorporating public health principles into the curricula of more pre- and postdoctoral dental education programs and/or increasing the number of dual-degree tracks in dentistry and public health.[9]

Academic Courses

Ahead of the introduction of CODA's 2013 standards, CHAT-PD had added eight new required courses for pediatric dental residents: Community Partners & Oral Health Systems of Care; Interprofessional Education & Training; Quality Improvement; Cultural Competency; Ethics & Professionalism; Disease Management & Risk Assessment; Policy & Advocacy; and Statistics & Research Methods. These courses are outlined in Figure 1.

The Community Partners & Oral Health Systems of Care course gives residents a systems perspective for improving the oral health of chil-

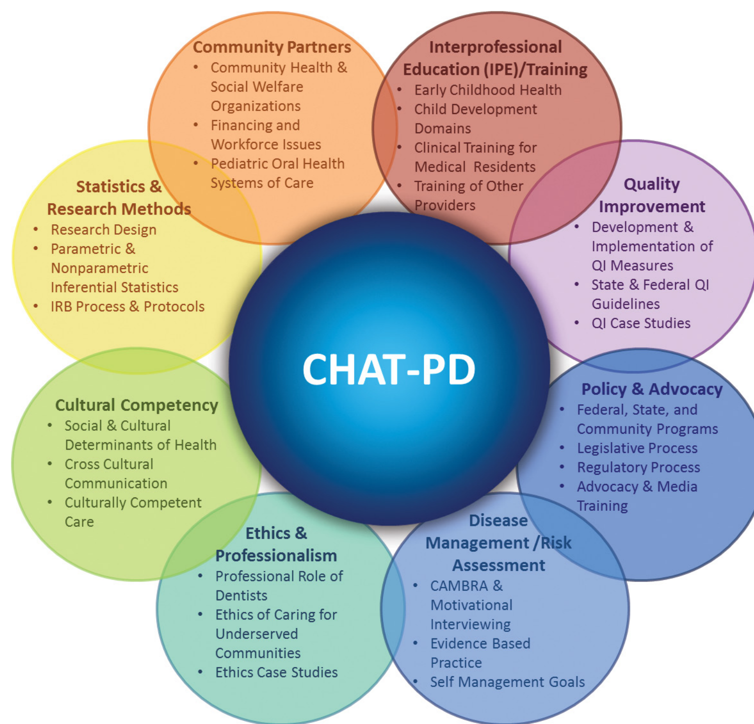

Figure 1. The CHAT-PD program's eight required didactic courses

dren. Specifically, it lays a critical foundation for understanding the oral health care delivery system, including its relationships with local community organizations, public and private sector payers, and policymakers. Key players like the Women, Infants, and Children (WIC) and Early Head Start programs are essential as collaborators to ensure good oral health services for the populations they serve.

Interprofessional Education (IPE) & Training, the second course, provides cross-training in the oral manifestations of chronic disease for non-dental providers. CHAT-PD residents engage in academic and clinical activities with non-dental providers to foster mutual learning in how oral health and systemic health interact across the lifespan as well as how to recognize the oral manifestations of systemic disease. We have created some key IPE collaborations with pediatrics and nursing students and the School of Public Health. Quality Improvement, the third course, enhances residents' ability to continuously improve oral health care services and health status of their targeted patient groups: children, particularly the underserved. The incorporation of quality improvement outcome measures allows comprehensive evaluation of the mouth, rather than merely tooth surfaces or dental structures.

In the Cultural Competency course, residents learn to think broadly about how one's culture influences attitudes, behavior, and oral health. Addressing the needs of populations different from one's own helps develop a greater understanding of and empathy for diverse groups. Building on this focus, the Ethics & Professionalism course emphasizes placing the patient's best interests ahead of competing interests. This course encourages residents to choose strategies that will have the greatest impact on reducing oral disease rather than those that merely maximize compensation. Disease Management & Risk Assessment, the sixth course, provides residents with a background in early and minimally invasive pediatric dentistry, individual oral health assessment, and treatment for pregnant women, infants, children, and caregivers. This course encompasses assessment of multiple determinants of oral health including genetics, individual health behaviors, and external factors such as social norms in a family,

community, and public policy as the basis for devising interventions that support protective factors and reduce harmful ones.

The Policy & Advocacy course exposes residents to the legislative process and advocacy strategies to promote oral health at the local, state, and national levels of government. At the conclusion of this course, residents participate in advocacy initiatives organized by the American Academy of Pediatric Dentistry (AAPD) in Washington, DC. While there, they attend seminars on oral health and hold meetings with legislators and their staff members to promote improved access to high-quality oral health care, particularly among vulnerable populations. The final course, Statistics & Research Methods, a longstanding requirement of the pediatric residency program prior to CHAT-PD, has since been updated to include dental public health principles for research design and statistics. This course culminates in a research project that gives residents a chance to delve into a topic inspired by their coursework, clinical training, or applied learning experiences.

Clinical Training

CHAT-PD residents participate in multiple clinical environments, one of which is an applied learning experience. Clinical training includes traditional rotations through one of UCLA's dental clinics, in either Westwood or Venice, both of which incorporate CHAT-PD principles, such as assessment using the validated tool Caries Management By Risk Assessment (CAMBRA).

The CHAT-PD program focuses on increasing early access to oral health services through the provision of care in nontraditional settings, particularly those sites serving vulnerable populations. Through both community-based applied learning experiences and practicum activities, residents gain experience building relationships with community partners that help them engage those who might otherwise not seek out oral health care services. Furthermore, residents have the opportunity to work with vulnerable populations and collaborate with professionals outside of dentistry. This increases their level of civic engagement and social responsibility[10,11] and their ability to work as members of interdisciplinary teams to provide culturally sensitive, ethical, high-quality care and patient advocacy for varied patient populations.

Applied learning experiences: community-based. Residents are required to complete at least two community-based clinical rotations prior to graduation, including one through the Infant Oral Care Program (IOCP) and one through a community organization of the resident's choice. IOCP offers comprehensive dental services at no cost to infants and children from low income families, in partnership with a local community clinic and nearby social welfare organizations such as WIC, Early Head Start, and Head Start program sites. Significant effort is made to ensure that care is culturally appropriate and competent by offering services and oral health literature in the patient's primary language, supplemented by visual aids. Cultural traditions and environmental and socioeconomic factors that affect risk for oral disease are also considered when assessing individual risk by age and race, using CAMBRA, and designing appropriate patient-centered treatment plans.

Applied learning experiences: practicums. Residents must also complete two separate practicum activities in which they learn to partner with local entities (schools, children's programs, and community clinics) to serve populations in need of oral health education and services. These practical experiences are categorized into two levels. Level 1 requires that residents participate in an oral health activity or event led or organized by a community organization. Level 2 requires that residents assume a leadership role for an activity with a community organization and then actively participate in conducting the event. For each of their experiences, residents must submit reports that include evaluations by participants.

For example, the American Dental Association annually promotes the Give Kids A Smile (GKAS) program, which supports community events at which underserved children receive free dental screenings, treatment, and education. If residents take part in a GKAS event already planned in their community, they will have completed a Level 1 practicum. If they assume the lead in planning and in establishing a working relationship with a clinic or community organization for a GKAS event, they will have completed a Level 2 practicum.

Research and Online Learning Platforms

As part of their educational requirements, residents must complete a research project. Residents may choose any topic, including translational, clinical, or health services research as a project for their CHAT-PD coursework and experiences.

In 2012, we began developing an online learning platform for CHAT-PD. The platform, consist-

ing primarily of an archive of lectures and learning resources as well as self-study course materials, was launched in July 2013, making it the first online learning platform at the UCLA School of Dentistry (www.uclachatpd.org). Additional site content may be made available to students and practitioners upon request. CHAT-PD's online platform is essential to the program's sustainability, as it preserves the sessions of visiting or retiring lecturers on topics that remain germane but may otherwise not be available. Faculty availability can be maximized with core course content recorded for future viewing. Assigning residents to view the lecture prior to their class sessions, similar to assigned reading, allows more classroom time for in-depth discussions and case study review.

It was equally important to implement an electronic health record system in order to facilitate data capture for program quality improvement analysis. Resources were committed to modifying the primary records systems, General Systems Design, to allow tracking of the CAMBRA and Self-Management Goal forms as part of the electronic record and for the conversion of all paper health records.

New Innovations, an online residency management program that unifies program and resident information into a centralized data hub, was also implemented, allowing CHAT-PD users to complete multiple manual tasks through a single common interface. The software is used by faculty, residents, and staff to assist with scheduling, case logging, evaluations, monitoring conference attendance, duty hours, and general personnel tracking. This complex but simple-to-use management suite was selected because it was designed as an integrated solution for medical education programs at schools, hospitals, and private practices around the world to create a professional health care training and education tool.

Program Evaluation and Analysis

To gauge its success, several aspects of the CHAT-PD program are continuously monitored using a variety of evaluation tools developed by faculty from UCLA's Clinical and Translational Science Institute. Program performance measurements have been developed in two distinct tracks: 1) the efficacy and appropriateness of the added curriculum and 2) the impact on postgraduate practice placement and behaviors.

CHAT-PD encourages recruitment and enrollment of qualified candidates from underserved, minority, and economically disadvantaged groups. Program analytics were designed to recognize that these graduates could skew placement results since they are more likely to accept positions in areas that CHAT-PD advocates due to a background bias or in order to receive student loan forgiveness. In order to normalize results, postgraduate behavior and attitude analysis is scheduled to begin in 2014, thereby allowing the first cohort of graduates to make longer termed and more intentional practice decisions that will more accurately reflect the impact of the CHAT-PD curriculum on practice.

The CHAT-PD program has received two consecutive Health Resources and Services Administration (HRSA) grants to support program development. Under the newest grant (Grant ID: D88HP20129), there were significant changes to the program design, including the integration of the CHAT-PD curriculum for all pediatric residents into what was formerly two distinct resident training tracks. Therefore, for purposes of analysis of the curriculum phase, the program evaluation will examine metrics beginning with the resident admission year of 2011-12 and a graduation date of 2013. Data from the admission year 2010-11 will be considered as the baseline. For the second phase of evaluation beginning in 2014, which examines graduate practice behaviors and attitudes, all CHAT-PD curriculum program graduates will be tracked and surveyed. This includes graduates from 2008 through 2015, for a total of forty-two graduates.

Process

The evaluation process utilizes a set of pediatric dentistry competencies based on the Pediatrics Milestone Project,[12] a collaborative research project by the Accreditation Council for Graduate Medical Education and the American Board of Pediatrics. This research focuses on how knowledge, skills, and attitudes are developed in order to define milestones in education for pediatricians.[13] These proficiencies will be modified for the pediatric dental residency program to appraise the level of performance residents achieve every six months as they move through CHAT-PD. Additionally, residents' intentions to serve vulnerable populations, either by working at a community clinic or accepting Medicaid in their own practices, will be explicitly evaluated following applied learning experiences and in their exit interviews at graduation from the CHAT-PD program.

Integration of CHAT-PD into the UCLA School of Dentistry's curriculum has been measured in a number of ways. The quantity and quality of activities implemented, such as the number of new courses and course sessions offered, applied learning experiences, research opportunities, and clinical rotations available, and course evaluations have been documented (Table 1). In mid-2012, the emphasis moved from the development and refinement of didactics to the improvement of productivity through online access for class materials, lectures, and scheduling. Table 2 shows the number of didactic sessions and hours for each program year as well as the number of sessions and hours made available online.

Clinical and Applied Learning Experiences and Research

Since its inception, the Infant Oral Care Program (IOCP) has been the model for combined clinical and applied learning experiences. Each quarter, interprofessional treatment teams from related specialties and community groups are assembled. IOCP, which emphasizes preventive care, has served several hundred patients and has seen positive attitudinal and behavioral shifts towards improved oral health among patients, improved continuity of care, and better collaboration between dental and medical homes. Data have been collected from the caregivers of patients on patient satisfaction in conjunction with children's oral health outcomes. The CAMBRA tool is used as part of an established six-step protocol at each visit to measure a range of metrics from risk for early childhood caries to the onset and progression of clinical symptoms of disease.[14]

Table 3 shows the total number of patients who have been seen at one or more IOCP recall visits and tracks their change in dental status. It was anticipated that in this high-risk Los Angeles County population, with a caries prevalence rate of 73 percent for children up to five years of age, some children would show some disease progression in spite of aggressive intervention. The IOCP found that only 11.6 percent showed a progression in disease: early and consistent care deterred advancement of disease in 88.4 percent of the children. The applied learning experience offered through the IOCP has been successful in enrolling providers of all types. For the two-year period July 2011 to July 2013, a total of eighty-eight health care providers rotated through the program (Table 4). At the UCLA Children's Dental Clinic in Westwood, where residents began receiv-

Table 1. Summary of CHAT-PD program evaluation tools

Program Aims	Evaluation Tools
1. Integrating CHAT-PD into the UCLA School of Dentistry curriculum	• Knowledge pretest for new residents • Periodic competency evaluation • Practicum experience reporting • Course evaluation • Integration Matrix* • Exit survey for graduating residents • Tracking clinical outcomes
2. Using distance-learning technology to facilitate program implementation	• Integration Matrix*
3. Recruiting faculty, staff, and students interested in participating in and supporting CHAT-PD	• Tracking student enrollment and participation of staff and faculty
4. Expanding the reach of CHAT-PD beyond the pediatric dentistry residency to other educational programs, such as those for general dentists, primary care physicians, and nurse practitioners	• Interprofessional education (IPE) evaluation form for pediatric dental residents completing IPE with pediatricians • Infant Oral Care Program evaluation of volunteers rotating through the program
5. Creating a dual-degree program with the UCLA School of Public Health	• Tracking progress in developing infrastructure and implementation plan • Tracking experience of trial dual-degree students

*The Integration Matrix cross-lists each course against various technologies including program-specific websites, distance-learning technology, and online platforms used for course support.

Table 2. Didactic part of the CHAT-PD program

Year	Number of Didactic Sessions Added	Number of Didactic Hours Added	Number of Didactic Sessions Available Online	Number of Didactic Hours Available Online
2011[a]	16	32	0	0
2012	31	71	0	0
2013	32	84	37[b]	70.5[c]

[a]First year CHAT-PD was implemented for all pediatric residents.
[b]Includes some sessions recorded in 2012 but not previously available online. In addition, sessions that were primarily case review and/or classroom discussion were not recorded or made available online.
[c]Rotations include multiple sessions of didactics or clinical time.

Table 3. Number of Infant Oral Care Program patients seen at baseline and follow-up visits by CHAT-PD program residents, 2011-13

Code	Number at Baseline	Number at Follow-Up	Total Change
Code I (no visible dental problems)	204	168	-36
Code II (early evidence of caries)	66	90	+24
Code III (evidence of dental problems/caries)	45	53	+8
No data	5	9	+4

Note: Total patients seen over three-year period was 685, of which 320 returned for their recall visit.

ing CAMBRA training in 2011, the number of risk assessments administered rose from zero in 2011 to 259 (36.1 percent of patients) in 2012 and 366 (55.8 percent) for the ten months ending in October 2013.

There has also been a significant increase in community- and advocacy-related research topics in 2013 as compared to clinical research topics in 2009 (Table 5). (The graduating class of 2009 was used since it was the last class prior to introduction of the CHAT-PD research requirement; all members of the class of 2010 conducted a CHAT-PD research project but not all residents received the full CHAT-PD program curriculum.) We attribute this change to the improved didactic and clinical experience our residents receive through the CHAT-PD program.

Table 4. Provider types participating in CHAT-PD Infant Oral Care Program applied learning experience between July 2011 and July 2013

Provider Type	Number of Participants
Dentists	5
Pediatric dental residents	18
Predoctoral dental students	37
Pediatric dental preceptors	14
Nurse practitioners	1
Predental students	6
Postbaccalaureate students	4
Translators	3
Pediatricians	1

Resident and Alumni Practice Changes

Several surveys of residents have been conducted during the course of training. In an assessment of the 2012-13 CHAT-PD program, the greatest changes in resident perception were in use of disease management and risk assessment protocols and interdisciplinary team approach. More second-year residents also reported participating in advocacy activities outside the CHAT-PD program. The preliminary cross-sectional analysis of surveys from residents and alumni one year after graduation revealed that 28.6 percent of the residents had participated in policy and advocacy activities, 28.6 percent had used disease management protocols, 42.9 percent had used caries risk assessment as a patient protocol, and 28.6 percent had experience working as part of an interdisciplinary team (Table 6). All residents (100 percent) knew what Medicaid is, and a majority (71.4 percent) had worked with Medicaid or other low income populations, including racial/ethnic minorities. More importantly, all indicated that they were comfortable working with these populations.

Table 5. Research topics comparison: pre CHAT-PD integration (2009) and post CHAT-PD integration (2013)

2009	Clinical	Public/ Community Health
Fluoride Levels in Los Angeles Tap Water	X	
The Effect of Jug Filtration Systems on Fluoride Concentration in Los Angeles Tap Water	X	
Parathyroid Hormone-Induced Expression of Chemokine CXCL1 in Primary Mouse Osteoblasts	X	
Effectiveness and Parental Acceptance of Nutrition and Healthy Lifestyle Promotion in Pediatric Dental Practices		X
Clinical Productivity of Pediatric Dental Practices With and Without EFDAs	X	
Interface Between Dentistry and Medicine in Children's Health: UCLA Cross-Training via Combined Provider Clinical Rotations		X

2013	Clinical	Public/ Community Health
Factors Affecting Pulpectomy Success in Primary Maxillary Incisors	X	
Evaluating CI-CARE Communication Training for Dental Students		X
Pulpotomy in Primary Molars: Does Base Material Influence Success?	X	
Factors Affecting Preschool Teachers' Promotion of Children's Oral Health		X
Attitudes of Dentists and Dental Students Regarding Perinatal Oral Health Care		X
Caries Experience and CAMBRA Risk Factors of Pre vs Full-Term Children		X
Parenting Style Influence: How Parents Accept Behavior Guidance Techniques Used by Dentists		X
Are Disposing Factors to Dental Caries Followed by the UCLA Craniofacial Team?		X
Oral Health Literacy of Child Care Providers in West Los Angeles		X
Comparing Afterhours Call Protocol of Pediatric and General Dentists		X

Table 6. Results of resident and alumni surveys, 2012-13

Question	n	Residents Percentage	Alumni Percentage
Have you engaged in policy or advocacy activities outside of the CHAT program?	14	28.6%	42.9%
Have you engaged in policy and advocacy activities in support of oral health?	14	28.6%	42.9%
Have you used disease management protocols to help your patients manage their oral health in the past?	14	28.6%	100%
Have you done caries risk assessment in the past?	14	42.9%	71.4%
Are you familiar with any caries risk assessment tools, such as CAMBRA or SMPs?	14	28.6%	100%
Have you worked on an interdisciplinary team for patient care in the past?	14	28.6%	100%
Do you know what Medicaid and Medi-Cal are?	14	100%	100%
Have you worked with Medicaid or Medi-Cal patients in the past?	14	71.4%	100%
Have you worked with low-income patients in the past?	14	100%	100%
Have you worked with minority patients in the past?	14	100%	100%

Note: Alumni were surveyed one year after graduation.

Furthermore, most participants reported that they were likely to work with these populations in the future, including treating Medicaid patients (Table 7). There was an increasing percentage of intention to treat Medicaid patients from first-year pediatric dental residents to graduates.

Table 7. CHAT-PD participants' intention to treat Medicaid patients, 2012-13

	Percentage Who Will Treat Medicaid Patients
First-year residents	67%
Second-year residents	71%
Graduates	83%

Discussion

The CHAT-PD program has developed significantly since its inception—training residents to become experts in the clinic, challenging them academically through research, refining their leadership skills, and improving their cross-cultural effectiveness. The pilot clinical rotations began in Los Angeles in 2006 and in San Diego in 2008. Since July 2012, the UCLA School of Dentistry has had a fully implemented, integrated CHAT-PD program. Since 2010, IOCP has also been fully implemented. At the end of 2013, segments of the CHAT-PD didactic curriculum were incorporated into the school's Advanced Education in General Dentistry (AEGD) residency program. In 2014, we plan to incorporate segments of CHAT-PD didactics into the General Practice Residency (GPR) program.

Interprofessional education is a key component of the program, with the aim of increasing training in communication and leadership among a broader spectrum of professionals with the shared goal of improving the health of vulnerable populations. The IOCP intentionally structures treatment teams to provide IPE to interested community partners. Residents are also encouraged to include IPE as one of their practicum experiences. CHAT-PD seeks to create leaders who can, through experience in simulated and real-life scenarios, achieve a better understanding of one another's roles in patient care.

At the 2013 Annual Session of the AAPD, all ten second-year residents presented posters, compared to one to three residents previously presenting posters each year. Of these ten research presentations (Table 5), two projects were on more traditional dental research topics (e.g., pulp therapy), whereas the remaining posters focused on topics aligned with CHAT-PD principles of prevention and minimally invasive dentistry for at-risk populations. Four projects explored aspects of preventive dentistry, one focused on quality improvement, one assessed community partnerships, one examined patient behavior management, and one investigated the recognition of social determinants in patient management in another dental specialty.

Student and faculty recruitment from underserved populations will also improve these graduates' cultural competence. Students and faculty members who better understand the cultural and social values of a population can share this knowledge with their peers.[15,16] Moreover, even despite reduced reimbursement, dentists from historically underrepresented populations are more likely to provide care in underserved areas compared to their counterparts.[17] This strategy can help ease the problem of workforce shortages in underserved areas and for underserved populations. In the interim, creative ways to meet the demand include making greater use of community-based dental education to offer free or low-cost dental services, incorporating dental training into the curricula and delivery systems of other health professions,[9] and using technology to extend care to underserved areas.

We conducted a survey of alumni of the CHAT-PD program to determine if there was a correlation with these students' intentions to work with low-income populations, as opposed to actual postgraduate practice decisions. The survey found that some alumni transitioned to jobs with Federally Qualified Health Centers (FQHCs), organizations that receive grants under the Public Health Service Act in return for providing care to underserved populations.[4] Although the majority chose to work in private practice, they indicated that a number of their patients were Medicaid beneficiaries.

Overall, the CHAT-PD program has been important in ensuring that pediatric dental residents gain experience in policy and advocacy activities and in using disease management and caries risk protocols. However, the program has not had more than a slight impact on their intention or actual decision to work with low income populations, such as Medicaid beneficiaries, outside of accepting them in their private practices. These graduates also demonstrated an

increased awareness of vulnerable populations, but this may be due to a selection bias since residents applying to the program are probably already interested in providing care to the underserved but not necessarily in a public or community health setting. Future surveys will be revised to account for this bias.

Conclusion

Access to preventive dental services for infants and toddlers is an aspect of dentistry in need of considerable improvement, since many dentists, especially non-specialty dentists, rarely see children younger than three.[18,19] Furthermore, substantial gaps exist in oral health outcomes and access to care, with minorities and those of low socioeconomic status having reduced access to care in addition to bearing the heaviest burden of disease. As ways are sought to improve dental education to address these needs, we must ask if the moral imperative of the educational system is to work towards the public good and do more than just teach about inequalities in access and treatment. If so, we must ensure that education not only teaches dentists strategies to treat individual patients for the symptoms of disease but also actively informs them about how to prevent the onset of disease in the first place.

The CHAT-PD program envisions having a measurable impact on the composition, distribution, and quality of the dental workforce. Future pediatric dentists and others who take part in program modules and applied learning experiences will be equipped to address the social and environmental determinants of oral health and provide patient-, family-, and community-centered care; utilize individual and community-based health promotion, prevention, and disease management strategies; and advocate on behalf of children and families by supporting policies and more comprehensive and integrated approaches to delivering oral health services. One of the most effective methods for reducing the burden of disease is through prevention, and prevention is best started early, with children.

Although still in its infancy, the CHAT-PD program shows great promise for training pediatric residents skilled in improving oral health for individual patients and the population at large, fostering interprofessional education, and integrating oral health care into the scope of other types of health care practitioners. As CHAT-PD continues, the impact and quality of the program will be monitored to increase its effectiveness and sustainability through curriculum improvement, faculty recruitment and development, and an expansion of its network of community partners and applied learning experiences.

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