Pre- and Postdoctoral Dental Education Compared to Practice Patterns in Special Care Dentistry


Abstract: There has been limited research into the impact of predoctoral experiences and postdoctoral general dentistry residencies on the practice patterns of dentists in the care of patients with special or complex needs. This study was undertaken to determine if educational experiences with special populations had a relationship to practice patterns after graduation or residency. University of the Pacific alumni who graduated between 1997 and 2007 were surveyed regarding their pre- and postdoctoral dental education and their practice patterns for the care of patients categorized as medically compromised, frail elders, and developmentally disabled. Definitions for each patient category were provided. Alumni were asked about their practice setting and postdoctoral education. Thirty-one percent (n=526) of those surveyed responded. Regression analyses showed respondents not in private practice were more likely to have completed a postdoctoral general dentistry program (Advanced Education in General Dentistry or General Practice Residency) after dental school compared to respondents in private practice (p<0.001). Across all age groups, respondents not in private practice treated significantly more patients with developmental disabilities than those in private practice (p<0.001). Respondents not in private practice treated more medically compromised patients younger than age sixty-five compared to respondents in private practice (p<0.01). Interestingly, those in private practice treated significantly more patients over sixty-five who were also classified as medically compromised (p<0.05). Pacific alumni who completed postdoctoral training in general dentistry were found to practice more often in non-private practice settings. Alumni in non-private practice settings reported treating a higher percentage of medically compromised patients below age sixty-five than their counterparts in a typical private practice. The pre- and postdoctoral experiences of treating special needs populations appear to have a relationship to graduates’ practice setting and patient population.

Dr. Subar is Assistant Professor of Dental Practice and Director, Special Care Clinic/Hospital Dentistry Program, Arthur A. Dugoni School of Dentistry, University of the Pacific; Dr. Chávez is Associate Professor, Removable Prosthodontics, and Director, Pacific Dental Program at Laguna Honda Hospital, Arthur A. Dugoni School of Dentistry, University of the Pacific; Dr. Miles is Professor, Management, Eberhardt School of Business, University of the Pacific; Dr. Wong is Professor of Dental Practice and Director of Hospital Dentistry, Arthur A. Dugoni School of Dentistry, University of the Pacific; Dr. Glassman is Professor of Dental Practice and Director of Community Oral Health, Arthur A. Dugoni School of Dentistry, University of the Pacific; and Dr. LaBarre is Associate Professor, Removable Prosthodontics, Arthur A. Dugoni School of Dentistry, University of the Pacific. Direct correspondence and requests for reprints to Dr. Paul Subar, Arthur A. Dugoni School of Dentistry, University of the Pacific, 2155 Webster Street, San Francisco, CA 94115; 415-749-3374 phone; 415-749-3339 fax; psubar@pacific.edu.

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The population of patients with complex needs has been rapidly growing and represents a group of patients that has great challenges in accessing oral health care. According to the U.S. Census Bureau, 35 million people have at least one of the following conditions: hearing difficulty, vision difficulty, cognitive difficulty, or limited ability for self-care. Estimates project that within the next twenty years, 20 percent of people in the United States will be over the age of sixty-five with high rates of disability. This shifting demographic will increase the health care spending of the United States by roughly 25 percent and will require a larger cadre of oral health providers knowledgeable in their care than we currently have available. Advances in medical technology have increased the likelihood that people with multiple medical problems and developmental disabilities will have a longer life expectancy. Untreated dental disease has been found in 25 percent of those with cerebral palsy and in 30 percent of those with traumatic head injuries. Dental care is needed but unobtainable, as reported by 3.6 percent of the noninstitutionalized population over age sixty-five. However, 70 percent of the roughly two million patients residing in nursing homes have chronic dental problems, total edentulism, or partial edentulism that affect their chewing ability and nutrition. Patients with multiple comorbidities will create new challenges for oral health care professionals in the future.
Historically, there has been little educational emphasis in dental schools, either clinically or didactically, on the treatment of patients with complex needs. Previous studies have demonstrated the limited student competence in providing care to this patient population upon graduation. In response to mounting evidence of the lack of education in this area, the American Dental Association’s Commission on Dental Accreditation adopted standards addressing the training of dentists in caring for patients with special needs in 2007. The language of the standard emphasizes patient assessment but does not specify the mechanism for delivering care to this patient population. Additionally, there are differences in the standards for predoctoral and postdoctoral education.

In 2001, The California Endowment joined the Robert Wood Johnson Foundation in funding a program called Pipeline, Profession, and Practice: Community-Based Dental Education in fifteen U.S. dental schools. One goal of the $25 million grant was to enhance dental access via dental schools to patients who have historically encountered barriers to receiving oral health care. Schools directed their efforts at increasing senior extramural rotation days by placing students in communities where oral health access barriers were most often encountered. Additionally, there was a commitment to enhance cultural understanding throughout the dental schools as well as intensified recruitment of underrepresented minorities and low-income students. The University of the Pacific (UOP) was funded for an additional three years through the Phase II pipeline grant. The schools that participated in the program, including Pacific, reported significant increases in the number of days that students rotated to extramural programs. A study of Pacific alumni found that those who reported more opportunities to treat patients with special needs in dental school treated more patients with special needs after graduation. In addition, those who perceived their predoctoral education as more valuable treated more patients and sought advanced education in general dentistry more often than those who did not. While there have been some gains in preparing predoctoral dental students to treat patient populations with special treatment needs, there has been limited research into the impact of predoctoral and postdoctoral education on practice patterns of dentists in the care of patients with complex needs.

The purpose of this study was to determine if experiences as a dental student or additional postdoctoral training had a relationship to UOP graduates’ practice patterns for the care of special patient populations. We examined those who completed a general dentistry residency program and those who did not, comparing their reported delivery of dentistry to patients with a developmental disability, those who are medically compromised, and those considered frail elderly. We compared postdoctoral experiences in the care of patients with complex needs to the patient populations that are treated by UOP graduates.

**Methods**

Institutional Review Board approval was granted to the study by the University of the Pacific prior to our sending out the alumni survey. Funding was provided by the University of the Pacific Arthur A. Dugoni School of Dentistry’s Departments of Dental Practice and Removable Prosthodontics. Respondents were not self-identified. Surveys were mailed to Pacific alumni who graduated between 1997 and 2007 in either the Doctor of Dental Surgery or the International Dental Studies program. Using Survey Monkey, a second request to complete the survey via e-mail was sent to the same alumni, providing them a second opportunity to respond if they had not done so already.

Respondents were asked if they had many or few opportunities to provide care for the defined patient populations while in school. Opportunities were rated on a ten-point scale ranging from 0=none to 10=many. Alumni were also asked if they had completed an Advanced Education in General Dentistry (AEGD) or a General Practice Residency (GPR) or any continuing education in the care of patients with special needs. They were asked to describe their scope of practice and practice settings and to estimate percentages of patients with complex or special needs, including their ages, in their respective practices. (Contact the corresponding author for a copy of the survey.)

Terms were defined as follows:
- **Medically compromised**—refers to people with a severe systemic disease(s).
- **Frail elders**—refers to adults over sixty-five years of age who have functional impairments with basic activities of daily living, such as bathing, eating, dressing, toileting, or mobility as a result of physical and/or cognitive impairments.
- **Developmental disability**—refers to intellectual disability, epilepsy, cerebral palsy, and autism.
Four categories, comprised of all combinations of questions related to postdoctoral education, were created to facilitate the analysis of the data. Respondents indicating that they were specialists were also included in the analysis. These categories were as follows:

**Category 1.** Those who completed an AEGD/GPR and have taken continuing education courses to expand knowledge of special populations.

**Category 2.** Those who did not complete an AEGD/GPR and have not taken continuing education courses to expand knowledge of special populations.

**Category 3.** Those who did complete an AEGD/GPR but have not taken continuing education courses to expand their knowledge of special populations.

**Category 4.** Those who did not complete an AEGD/GPR but have taken continuing education courses to expand their knowledge of special populations.

Data were analyzed using regression analysis and analysis of variance (ANOVA), chi-square, and/or t-tests. Significance was defined as p≤0.05.

### Results

The survey yielded a 31 percent response rate (n=526). Alumni who treated statistically more patients with complex needs also reported more predoctoral and postdoctoral experience with these patient groups. There were statistically significant differences in self-reported number of opportunities to provide clinical services for the three different types of patient populations during dental school when compared across the four categories of alumni. The largest difference regarding predoctoral experiences was seen in the care of patients with developmental disabilities. Those who completed a postdoctoral residency, regardless of whether they took continuing education courses or not, reported more predoctoral experience treating patients with developmental disabilities (3.76 versus 2.2; p=0.0004; Figure 1).

Alumni practitioners who have completed a postdoctoral residency treat significantly more patients with developmental disabilities than those who have not completed a residency (9.48 percent versus 2.65 percent; p=0.012; Figure 2). Further, the largest difference recorded for practicing alumni was a comparison of those who completed a postdoctoral residency versus those who did not—dependent of continuing education—and the percentage of patients they treat in their practices who are medically compromised: 20.44 percent versus 7.75 percent, respectively (p=0.004; Figure 3). Analysis of regression demonstrated respondents not in private practice were more likely to have taken an AEGD or GPR degree after dental school compared to respondents in private practice (p<0.001).

Across all age groups, respondents not in private practice treated significantly more patients with developmental disabilities or medical issues than those in private practice (p<0.001). Across two age categories (<17 and 18–64), respondents not in private practice treated more medically compromised patients compared to respondents in private practice (p<0.01 in both cases). However, a positive relationship emerged between respondents in private practice and special populations over age sixty-five (p<0.01).

### Discussion

Oral health care professionals are treating more patients who are medically compromised, frail elders, and those with developmental disabilities than ever before. To facilitate the delivery of care to those who are medically compromised, developmentally disabled, or frail elders, dental schools must provide students with valuable experiences in the predoctoral environment that encourage them to treat these populations and seek further training in a postdoctoral residency program. Interestingly, UOP alumni in private practice report treating a significantly higher proportion of patients over sixty-five years of age with developmental disabilities or who are medically compromised than those in alternative settings where we might expect a higher number of these patients to be treated. One explanation would be that these older patients generally seek care in private practice settings more often than in nontypical settings, or perhaps these patients have aged with the practice.

UOP graduates of postdoctoral general dentistry programs treat more patients in each category of special patients than non-postdoctoral general dentistry program graduates. However, continuing education may also be a factor in caring for special populations when a practitioner has not completed a residency program. Since the population of patients with complex needs is growing, these findings should encourage dental schools to increase opportunities for students to provide more clinical services to these patient populations, as well as more opportunities...
versus their non-residency-trained counterparts or are perhaps more comfortable in settings requiring a different skill set acquired through advanced training. Alumni in settings other than private practice treat a higher percentage of medically compromised patients below age sixty-five. These other settings included community clinics, military sites, hospitals, Department of Veterans Affairs sites, long-term care facilities, and academic institutions.

Conclusions

The population of the United States is aging and living longer with more complex medical and developmental conditions. Dentists in both typical and non-typical practice settings will encounter these patients on a more regular basis. While dental school programs are slowly improving to keep pace with this changing patient demographic, the existing dental school training program may not be sufficient to meet this challenge. Pacific graduates of postdoctoral training programs tend to view more positively their predoctoral clinical experiences in caring for patients with complex needs. With the support of the Pipeline program, Pacific experienced an increase in for continuing education. This outcome may be especially important for older, medically compromised patients who, in this study, sought care more often in general private practice settings.

We did not examine any inherent differences between AEGD or GPR programs, which could be considered a limitation of the study. We also did not factor out those who continued on past a general dental residency and completed specialty training. This may account for unexpected higher numbers for those treating medically compromised patients in private practice. Another study limitation is the self-reporting nature of the survey. Perhaps using official school data to track enrollment in residency programs may improve the validity of self-reported data. The variety of educational pedagogies that exist in differing programs may have an effect on practitioner preparation at the postdoctoral level. Additional studies can be done that specifically examine the relationship of predoctoral and postdoctoral pedagogies to alumni practice patterns.

UOP alumni who completed postdoctoral training in general dentistry practice more often in non-private practice settings. This suggests that students graduating from a postdoctoral residency program either have more experiences in non-typical settings versus their non-residency-trained counterparts or are perhaps more comfortable in settings requiring a different skill set acquired through advanced training. Alumni in settings other than private practice treat a higher percentage of medically compromised patients below age sixty-five. These other settings included community clinics, military sites, hospitals, Department of Veterans Affairs sites, long-term care facilities, and academic institutions.

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Figure 1. Average level of clinical services provided to patients with a developmental disability during dental schools, by Pacific graduates in four categories of postdoctoral education (p=0.0004)

Note: The y-axis represents a ten-point scale ranging from 0=none to 10=many patients with a developmental disability during predoctoral dental education. Categories of participants are represented by bars from left to right: graduates who did not complete a postdoctoral residency and have taken continuing education courses on care for populations with special needs; graduates who did not complete a postdoctoral residency and have not taken continuing education; graduates who completed a postdoctoral residency and have taken continuing education; and graduates who completed a postdoctoral residency and have not taken continuing education.
In addition to expanding and improving student preparation in the care of complex patients, new graduates should be encouraged to seek out continuing education courses that will prepare them to understand, diagnose, and treat the growing numbers of patients who are living longer with multiple comorbidities. By enhancing the predoctoral opportunities for students to gain clinical exposure to these patient populations in a variety of practice settings. Pacific students are seeking postgraduate general dentistry residency programs more than ever before. This may be due to the Pipeline program, the development of new educational pedagogies, or a combination of the two.

In addition to expanding and improving student preparation in the care of complex patients, new graduates should be encouraged to seek out continuing education courses that will prepare them to understand, diagnose, and treat the growing numbers of patients who are living longer with multiple comorbidities. By enhancing the predoctoral experi-
ence, encouraging a broader exposure to continuing education courses, and fostering development of the skills necessary to manage the complex patient, dental schools will keep pace with current trends of educating students in the care of a challenging, growing, and rewarding patient population. The importance of predoctoral and postdoctoral education and experiences cannot be underestimated. They are valuable factors in preparing the dental workforce to manage the needs of the growing population of medically compromised, developmentally delayed, and frail elderly patients.

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REFERENCES


