Critical Issues in Dental Education

A Snapshot of the U.S. Postdoctoral Pediatric Dentistry Faculty Workforce, 2002


Abstract: This study characterizes the faculty shortage in U.S. postdoctoral pediatric dentistry (PD) education. The objectives of the study were to determine: 1) the changes in PD faculty numbers and teaching loads between 1995 and 2002 for postdoctoral PD education, 2) current faculty age and training, and 3) distribution of faculty by age. A questionnaire was sent in 2002 to fifty-four programs, of which forty-six responded (85 percent). Dental school and residency mean class sizes increased in the seven-year study period from 82.8 to 91.8 and from 6.0 to 8.5, respectively. Full- and part-time mean faculty positions increased as did vacancies, the latter growing from 15 to 38.9 and changing during the period from 5 to 10.8 percent of available positions. About one-third of programs used general dentists to teach PD, while programs using foreign-trained educators grew from 4 to 13 percent. Twenty-nine percent of full-time faculty are fifty-five or older, and young entry-level faculty, age twenty-five to twenty-nine, represent only two percent and five percent of full- and part-time faculty respectively. Faculty vacancies have increased along with numbers of students and residents, and the largest segment of PD faculty is within a decade of retirement age.

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Faculty workforce as a vital sign of the health of dental education has elicited concern since the early 1990s. The American Dental Education Association (ADEA) recently placed the number of faculty vacancies at 344 positions, with 273 of these representing full-time faculty positions. ADEA further noted that 25 percent of dental schools have ten or more vacancies. The capacity of dental education to absorb significant loss of faculty and maintain educational quality remains unclear, particularly since dental school enrollment has increased about 9 percent in the decade ending in 2000.

The American Academy of Pediatric Dentistry (AAPD) first addressed workforce shortage in the early 1990s, focusing primarily on the number of U.S. private practice pediatric dentists and access to pediatric dental care. An offshoot of this workforce effort was creation of a taskforce, the Academic Workforce Committee, to address faculty shortages and the impending loss of large numbers of pediatric dental faculty to retirement. The urgency of the faculty shortage problem was accentuated by several important national events and trends in recent years:

- In 2000, the U.S. surgeon general confirmed significant oral health disparities in U.S. children, noting inadequate access to dental services.
- Also in 2000, the House of Delegates of the American Dental Association passed resolution 59H-2000 over growing concern about the perceived failure of dental education to adequately train general dentists in care of children.
- Successes in obtaining federal funding for postdoctoral education in Title VII, children’s hospital-based GME, and traditional GME dramatically increased the number of available positions.
for postdoctoral pediatric dentistry (PD) training and demand for faculty.

- Pediatric dental practice income rose steadily over the last decade with current annual net income for the specialty approaching a quarter million dollars, enticing specialists to choose practice over teaching as a career.7

Seale and Casamassimo8 have noted that PD predoctoral education already feels the loss of faculty. More than a third of schools have fewer PD faculty than five years earlier, and a third use general dentists to teach PD. In their study, 40 percent of schools had at least one faculty vacancy in their PD training program.

The study reported in this article was conducted by the American Academy of Pediatric Dentistry’s Academic Workforce Committee to characterize more precisely faculty workforce in postdoctoral PD education. The objectives of this study were to determine: 1) the changes in PD faculty numbers and teaching loads between 1995 and 2002, 2) current faculty age and training, and 3) distribution of PD faculty by age.

## Methods

A questionnaire was developed, pilot-tested within the committee, and revised. Questions addressed dental and resident class size, percentage of pre- and postdoctoral teaching distribution among full- and part-time faculty, filled and unfilled full- and part-time positions, and age of faculty. In order to prevent overlap of categories and to maximize clarity in response, a self-auditing format for the instrument was used. For example, when asking about the percentage of predoctoral and postdoctoral teaching by full- and part-time faculty, relative assignments had to total 100 percent. A similar format was used throughout the questionnaire to ensure accuracy in reporting faculty positions, filled and unfilled. Definitions of categories (for example, foreign-trained versus U.S.-trained) and expected totals (for example, 100 percent) were provided within each questionnaire section to prompt the respondents.

The questionnaire was sent to fifty-four U.S. PD postdoctoral programs in early 2002. Committee members contacted each program to encourage response and assist in completion of the questionnaire. Data were analyzed using simple descriptive statistics.

## Results

Forty-six programs returned a completed questionnaire for a response rate of 85 percent. Because some of the programs contacted were hospital-based and did not have dental students, several questionnaires were returned incomplete for items related to dental students. However, responses from these hospital-based programs are used to report data relative to postdoctoral training.

Dental student class size increased from a mean of 82.8 in 1995 to 91.8 in 2002. Twenty schools increased class size, eleven stayed the same, and three decreased class size. Resident class size went from a mean of 6.0 to 8.5 for the same period; thirty-seven programs increased residency size (including six new programs), seven stayed the same, and two decreased size. This change from 280 to 392 resident positions (all years) represents an overall increase of 40 percent in pediatric dentistry training positions.

Table 1 depicts overall changes in PD faculty nationally from 1995 to 2002. Respondents were asked to describe positions in both 1995 and 2002 with a “position” being one full-time equivalent (FTE). The number of both full- and part-time positions increased in the seven-year period, with new programs accounting for 20.6 of the thirty-two new positions and 10.95 of the 11.2 part-time positions. Similarly, the number of vacant positions, both full- and part-time, increased from fifteen vacancies in 1995 to 38.9 vacancies reported in 2002. When full-time vacancies are considered as a percentage of available faculty positions, the percentage more than doubles from 6 percent to 13 percent. When total vacancies (full-time plus part-time) are considered as a percentage of available positions, the percentage of vacancies doubles from 5 percent to 10.8 percent.

Table 2 provides a more intimate view of changes from the individual program perspective. We were interested in determining whether programs that experienced changes in student/resident positions had changes in available faculty positions and whether the available positions were filled with faculty. When programs were sorted by increases in either residency or dental class size or both, we found that eleven programs lost faculty positions, eight had no change in available positions, and seventeen had increases in faculty positions. However, our data also revealed that of the nineteen programs that either kept faculty positions static or lost faculty, thirteen also had unfilled positions. Even among the seventeen programs
that added faculty positions to accommodate increased student and/or resident positions, ten had unfilled positions.

We also wanted to test the accommodation of programs to faculty shortages by looking at shifts in teaching coverage by full- and part-time faculty. For example, a program that cannot find a candidate for a position or cannot fund a full-time faculty position might seek part-time faculty to cover teaching responsibilities. No attempt was made in the questionnaire to segregate clinical and didactic teaching; rather, respondents were asked to view teaching as a whole for each level of student. Table 3 shows the shift in percentages of time devoted to pre- and postdoctoral teaching by full- and part-time faculty and residents over the study period. While small changes were noted, none reached 5 percent.

We also found that the background and training of faculty changed slightly from 1995 to 2002. Thirteen programs used general dentists to teach pediatric dentistry in 1995, and this number rose slightly to sixteen in 2002. The number of programs using foreign-trained pediatric dentists, defined as those with non-U.S. training precluding full licensure in the United States, rose from two to six.

Finally, we were interested in the collective lifespan and repopulation of the pediatric dentistry faculty workforce. Respondents were asked to divide faculty into five-year age cohorts, ranging from twenty-five through twenty-nine years through sixty-plus years. Figures 1 and 2 show the distribution of full- and part-time faculty. While the largest cohort for full-time faculty was in the fifty to fifty-four year age group, the second largest comprised faculty over sixty years of age. For part-time faculty, the largest cohort was sixty-plus years of age. Summing the two oldest age cohorts for full- and part-time faculty provides a doomsday vision of pediatric faculty over the next decade. Twenty-nine percent of full-time and 27 percent of part-time faculty will reach age sixty-

| Table 1. Changes in faculty positions between 1995 and 2002 for postdoctoral pediatric dentistry training programs among forty-six responding programs |
|-------------------------|----------|----------|
| Change in Student and Resident Numbers | Number of Programs (number with unfilled positions) |
| Increased Dental Class/No Increase in Residency | 1 (1) | 1 (1) | 2 (2) |
| Same Size Dental Class/Increased Residency | 4 (3) | 3 (2) | 8 (4) |
| Increased Dental Class/Increased Residency | 6 (5) | 4 (1) | 7 (4) |
| Same Size Dental Class/No Increase in Residency | 0 | 7 (1) | 3 (2) |

| Table 2. Numbers of programs with changes in residents and dental students and changes in faculty positions among forty-six responding programs |
|-------------------------|----------|----------|
| Increased Dental Class/No Increase in Residency | 1 (1) | 1 (1) | 2 (2) |
| Same Size Dental Class/Increased Residency | 4 (3) | 3 (2) | 8 (4) |
| Increased Dental Class/Increased Residency | 6 (5) | 4 (1) | 7 (4) |
| Same Size Dental Class/No Increase in Residency | 0 | 7 (1) | 3 (2) |

| Table 3. Change in teaching assignments of full-time, part-time, and resident faculty among forty-six responding programs as a percentage of overall curriculum |
|-------------------------|----------|----------|
| Faculty Type | Student Level | 1995 | 2002 | Change 1995-2002 |
| Full-Time | Predoctoral | 41.1 | 45.0 | 3.9 |
| Postdoctoral | 56.0 | 57.1 | 1.1 |
| Part-Time | Predoctoral | 23.0 | 20.9 | -2.1 |
| Postdoctoral | 18.4 | 21.3 | 2.9 |
| Resident | Predoctoral | 5.4 | 7.4 | 2.0 |
Figure 1. Distribution of full-time faculty in pediatric dentistry training programs among forty-six responding programs.

Figure 2. Distribution of part-time faculty in pediatric dentistry training programs among forty-six responding programs.
five in ten years. Unfortunately, only 2 percent of full-time (n = 4) and 5 percent of part-time (n = 10) PD faculty are in the twenty-five to twenty-nine year age cohort, who represent the entering generation of educators. Even if these percentages are doubled, they do not replace those potentially aging out of dental education.

**Discussion**

While angst over the declining workforce in dental education is not a new phenomenon, specialty educator decline bodes poorly for dental education, access to care, and quality of care. Pediatric dental education is already showing signs of frailty, and hopes that advanced general dental residency training will strengthen practitioner skills with children have not been supported. We found in this study that a simple tally of vacancies tells only a small part of the story because it captures but a single piece of a complex puzzle and provides little information about the direction of change.

The implications of a collapsed PD pre- and postdoctoral education system—with few teachers, fewer pediatric dentists, and a potentially lowered quality of education—are staggering to dental education and pediatric oral health care. Several studies found that dentists’ willingness to treat children and special populations depends on the intensity of their educational experience. A diminished PD infrastructure would contribute to even less care for preschool and special needs children, already at dangerously low levels. Pediatric dentists also are more likely to see Medicaid children compared to general dentists. They staff pediatric medical facilities and, with oral and maxillofacial surgeons, represent dentistry’s presence in hospital care. With fewer pediatric dentists, dental care of children with systemic diseases would be difficult if not impossible. The dental public health community and uniformed services, which rely on pediatric dentists for training and care, would not be serviced.

On a seemingly positive note, the majority of dental schools and postdoctoral training programs responding to this survey reported that they had increased the number of students being trained in the seven-year study period. Dental schools or their parent institutions glean tuition dollars from increased class sizes. Postdoctoral training programs have been able to capture federal dollars through GME and Title VII mechanisms and can generate significant revenue from residency level providers. The heightened interest in pediatric oral health since 2000 has created opportunities for training programs to extend resident-generated services to community health centers, hospitals, and other clinics in exchange for compensation back to the program.

We found that sixteen programs are using general dentists to teach pediatric dentistry, which is consistent with the one third of schools doing so as noted by Seale and Casamassimo. Restorative dental education currently has the greatest need for faculty and would seem more amenable to general dental faculty replacements than specialty disciplines. Further research is needed to determine the extent to which all of dental education is de-specializing predoctoral training to save money or capitalize on the largest pool of potential educators. The number of PD programs using foreign-trained pediatric dentist educators increased only slightly over the seven-year period, from two to six, suggesting that this approach may not be considered a useful solution, perhaps due to licensure issues, variability in training, student body feedback, or ethical concerns about draining other countries of educated academic workforce. However, this change represents a rise of 4 to 13 percent of programs, and as U.S. candidates become more scarce, “reverse outsourcing” of dental faculty may become more attractive, and ways may need to be identified to facilitate recruitment of faculty from other nations.

The Commission on Dental Accreditation has recently expressed concern about increasing resident positions without adequate infrastructure and faculty. Increased numbers of residency positions and more dental student tuition offer potential financial support, greater access to services, and more providers graduating into the workforce. However, the toll on an already weakened infrastructure remains to be determined. Our data suggest that the majority of student body expansions are not accompanied by increases in faculty positions, programs expand while already in faculty deficits, and those few that do add positions often cannot fill them.

Perhaps most disconcerting is the impending potential loss of a large part of the pediatric dentistry education community to retirement. Our data clearly indicate that we are not replacing faculty in numbers adequate to maintain a system already understaffed. What our numbers do not answer are the following questions:

- Where will this significant replacement workforce come from in view of already sparse academic candidates?
• Are young replacement faculty now heavily research-oriented, with pressures of promotion and grant funding being their primary preoccupation, rather than teaching?
• What is the toll on other faculty who bear the weight of increased teaching loads, and will that toll force more of them to leave academics for practice?
• Do faculty shortages distract those within reach of retirement from program innovation and the necessary intensity of teaching special needs and preschool dental care?

Some have suggested that a solution to education’s problems is the master clinician, a retired or late-career dentist who comes back to academia to teach. Unfortunately, while this may help education, it simply shifts the workforce shortage to the pediatric dentistry practice community, where a similar crisis looms.4,16

The weaknesses of this study are the questionnaire’s limitations in terminology and interpretation and the possibility that the seven-year recall of respondents may be suspect. We chose the length of the time period so it would allow change to manifest itself and account for the increase in residency and class size that might affect faculty numbers. Ironically, based on the distribution of age of faculty, we are confident that institutional memory about staffing over the seven-year period was good! We also did not separate dental school-based, hospital-based, and combined programs in our results, and we recognize that findings may vary by type of the program. On the other hand, greater outreach activity in predoctoral dental education, affiliations among schools and hospitals, and new dental school creation with nontraditional models of care may make separation of programs a more complicated issue than can be described by our data.

Pediatric dentistry’s faculty shortage mirrors that of other specialties in dental education.17 The findings of this study may be applicable to other disciplines that presently enjoy enhanced opportunities of private practice complete with significant income, exciting challenges, and freedom from the mantle of academic advancement. The survival of dental education will depend, in part, on how quickly it addresses this problem. It remains to be seen whether dental education can escape the limitations of traditional university-based education, compete in the marketplace for the best and brightest, and maintain quality.

REFERENCES