

Meeting the Demand for Future Dental Faculty

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Abstract: The present status of dental faculty, including full-time clinical and basic science and part-time clinical, is reviewed. While the numbers of faculty have returned to the levels of the late 1980s, part-time clinical faculty comprise 28 percent of FTEs. Significant differences exist between public and private schools with regard to their use of clinical faculty. The proportion of full-time clinical faculty occupying nontenure track positions has grown to 24 percent. Women now comprise 18 percent of dental faculty but occupy a greater proportion of nontenurable positions. Both faculty and students from traditionally disadvantaged racial minorities are significantly underrepresented. A future shortage of clinical faculty is predicted with an estimated need for 200 to 260 new faculty each year. Available training opportunities are insufficient to meet this need. There are significant deterrents to preparing for and pursuing an academic career in dentistry, including the highly viable option of private practice, the changing expectations of academics, the time required to prepare for an academic career, the income differential between academics and private practice, and student debt. Possible actions that could create a more favorable environment for academic dentistry are suggested. These include rethinking the way dental schools and faculty are judged, with the unit of evaluation shifting from the individual faculty member to the department or school. A series of faculty tracks are described that assume individual faculty members will have different allocations of effort which will be equally valued, academic advancement considered, and compensation allocated accordingly. A compensation plan designed to close the income gap between academics and private practice and reward productive faculty is presented as a series of steps that have the potential to make an academic career more attractive.

Key words: dental faculty, academic careers, faculty appointments, diversity, tenure, compensation

A well-qualified faculty is essential to any educational effort. The availability of a sufficient number of faculty members possessing content knowledge, pedagogical expertise, sensitivity, and commitment will determine the quality of a student's educational experience. The future of dental education is closely tied to the continued existence of such faculty. Academic dentistry today functions in an environment that is rapidly changing and assuming new characteristics. Left unaddressed, these changes could adversely influence the decision of potential dental faculty to embark on an academic career. This paper attempts to describe this changing environment, identify the major deterrents to pursuing an academic career, and propose possible solutions aimed at creating a more favorable academic work environment. Above all, this paper seeks to heighten the awareness of those interested in maintaining the viability of the dental profession to a problem whose solution will require the involvement of all concerned.

Present Status of Dental School Faculty

Basic Science and Clinical Faculty

In the 1996/97 academic year, dental schools in the United States reported having approximately 1,150 basic science faculty; of these, 680 were related to the dental school only, i.e., were neither medical school faculty nor shared with a school of medicine. The clinical faculty was comprised of 3,577 full-time individuals, and 1,351 full-time equivalents (FTEs) were provided by 6,450 part-time faculty contributing on average slightly more than one-half day per week.¹ A fuller appreciation for the role of part-time clinical faculty comes with the understanding that they constitute 27.4 percent of the total FTEs for clinical faculty. Be-

Table 1. Comparison of enrollment and clinical faculty by type of institution 1995-1996

	N	%	DDS/DMD			Advanced Education			Allied Education			Total Enrollment	FTE Clinical			S:F
			N	% (1)	% (2)	N	% (1)	% (2)	N	% (1)	% (2)		% (1)	Faculty	% (1)	
Public	35	64.8	9091	54.9	76.9	1612	61.3	13.6	1113	61.4	9.4	11816	56.3	2830	63.2	4.18
Private	13	24.1	5432	32.8	82.3	742	28.2	11.2	429	23.7	6.5	6603	31.5	1223	27.3	5.40
Private/SR	6	11.1	2029	12.3	78.9	274	10.4	10.6	270	14.9	10.5	2573	12.3	422	9.4	6.10
Totals	54	100	16552	100		2628	100		1812	100		20992	100	4475	100	4.69

(1) Percentage of the total in the category.

(2) Percentage of total enrollment.

Source: American Dental Association 1995/96 Survey of Predoctoral Dental Educational Institutions, Vol. 3 Faculty and Support, 1996.

tween the 1986/87 and 1995/96 academic years, the numbers of basic science faculty declined approximately 27 percent, while clinical faculty decreased approximately 10 percent during the same time period.² In the most recent two academic years, dental schools experienced an increase in both basic science and clinical faculty, such that their numbers have returned to the levels seen in 1986/87.

Public, Private, and Private-State Related Schools

There are marked differences in the utilization of part-time faculty by type of school. In private dental schools, as defined by the American Dental Association based on type of funding when reporting the results of annual surveys, part-time faculty comprise 39 percent of the clinical faculty FTEs, 19 percent in public schools, and 25 percent in private-state related schools.² Dental school faculty, especially clinical faculty, are profoundly affected by levels of student enrollment. Again there are striking similarities and differences by type of institution (see Table 1). The distributions of dental, advanced dental education, and allied dental education students, expressed as a percentage of total enrollment, are very similar in public, private, and private-state related schools. However, private and private-state related schools, which are 35 percent of all dental schools, enroll 45 percent of the dental students, while employing 37 percent of the clinical faculty. As a result, overall student to faculty ratios are much higher at private compared to public schools. Such data should not be interpreted as indicating a lesser degree of clinical instruction where high ratios exist. Rather they point out that private and private-state related schools may be disadvantaged given the expectation for faculty to increase their productivity and, as

will be discussed later, be greater contributors to the parent institution's mission.

Academic Appointments and Tenure

The percentage of full-time clinical faculty tenured or on a track leading to tenure has decreased from 92 percent in the 1980/81 academic year³ to 72 percent in 1995/96 as the use of a full-time nontenure eligible track has been adopted by more institutions and used more frequently.² In 1995/96, only two dental schools indicated not having any faculty on a nontenure track, compared to only eight schools using such an appointment only sixteen years earlier. Historically, United States academic institutions have sought to recruit faculty who can excel in three areas: teaching, research, and service. These faculty members are recruited into mostly tenure-track positions. U.S. dental schools have tended to follow this model. However, over the past ten to fifteen years, there has been a shift among U.S. dental schools to the use of more nontenure track appointments.⁴

In its 1995 report on the future of dental education, the Institute of Medicine recommended dental schools supplement tenure-track faculty positions with full-time clinical or research positions as one method of addressing their challenges.⁵ Unpublished data presented by Hunt at the 1998 Annual Meeting of the American Association of Dental Schools demonstrate the shift toward more nontenure-track faculty positions is continuing.⁶ This study categorized full-time faculty into seven tracks, based on type of appointment (tenure vs. nontenure track) and relative emphasis of research and teaching in their work. These tracks are described in Table 2. Five of the tracks represent a continuum of decreasing research emphasis and increasing clinical emphasis. Two administrative tracks

occur outside this continuum of research vs. clinical emphasis. Other faculty appointment tracks also are used in dental schools, such as emeritus and adjunct, but they typically are part-time appointments and were not considered in this study.

The distribution of dental faculties as categorized by their deans in these seven tracks is displayed in Table 3. Full-time and faculty administrators comprised 15 percent of the faculty. Of the remaining 85 percent of the faculty, 24 percent were in nontenure-track appointments. This proportion exceeds those found earlier and is consistent with a trend toward greater hiring of faculty in nontenure tracks. The proportion of nontenured clinical faculty in U.S. dental schools already exceeds the 17 percent forecast in 1990 for the year 2000.⁷ This conclusion was corroborated by the deans, of whom 66 percent reported their schools had more nontenure track faculty than in 1990. Table 4 shows the reasons cited by deans for increases in nontenured faculty appointments. Most frequently cited were reasons associated with administrative flexibility and better fulfilling the school's mission, followed by concerns associated with achieving tenure. Less frequently cited were financial reasons. As previously reported for U.S.

medical schools,⁸ dental schools have found that the increased use of nontenured faculty increases administrative flexibility and adaptability to changes in the dental academic environment.

Women Faculty

While the faculties in dental schools remain dominated by white males, the number of female faculty increased by 35 percent between 1990/91 and 1995/96.¹¹ Women now comprise 18 percent of full-time clinical faculty. Of the 9,913 total full-time and part-time clinical faculty, 1,833 or 18.5 percent are women.⁽⁵⁾ Racial and ethnic minorities are 17.3 percent of full-time clinical faculty, of whom 28.6 percent are women. Since the 1993/94 academic year, women have constituted between 35 percent and 39 percent of United States dental school graduates, and first-year enrollment figures indicate this percentage will not change in the foreseeable future.¹ Since women will constitute a major portion of future potential faculty, it is important to know how their current academic appointments compare to their male counterparts. Seventy-four percent (74 percent) of male full-time clinical faculty are either tenured (54 percent) or on a track leading to tenure (20 percent), compared to 59 percent of women.² Much of this disparity can be explained by the average age of female faculty being less than their male counterparts and significant numbers of women being relatively new to the dental profession. Conversely, 41 percent of women in full-time positions have academic appointments that do not lead to tenure, compared to 25 percent of males, and when faculty status is compared by age, males between forty and sixty-nine years

Table 2. Faculty appointment tracks reflecting emphasis of research vs. teaching

Nontenure research track:	large majority of work on funded research, graduate student mentoring and teaching, relatively little predoctoral teaching
Tenure track, research emphasis:	majority of time devoted to research, graduate student mentoring and teaching, limited predoctoral teaching
Tenure track, clinician scholar:	fairly equal balance of research and teaching, teaching balanced between graduate and predoctoral
Tenure track, clinical emphasis:	limited research, usually with research faculty, some graduate seminar and clinical teaching, significant teaching in predoctoral program
Nontenure clinical track:	research, if any, is with research faculty, graduate teaching is mostly clinical, most of time devoted to predoctoral teaching
Faculty administrator track:	full-time academic appointment significant administrative responsibilities, teaching and research variable by person
Full-time administrator track:	most of time devoted to administrative responsibilities, limited teaching or research responsibilities

Table 3. Distribution of faculty appointment tracks in U.S. dental schools, 1997

Faculty Track	Percent of Faculty	
	Mean	S.D.
Nontenure research track	4.7	5.7
Nontenure clinical track	18.9	15.4
Subtotal, nontenure track	23.6	16.7
Tenure track, research emphasis	14.2	10.7
Tenure track, clinician scholar	21.3	18.6
Tenure track, clinical emphasis	25.8	19.3
Subtotal, tenure track	61.3	42.1
Faculty administrator	8.6	10.3
Full-time administrator	6.5	5.4
Subtotal, administrators	15.0	11.6

N=49 U.S. dental schools

Table 4. Reasons reported by deans for increase in the number of nontenure track faculty in U.S. dental schools

Reason for increase in nontenure track	Percent of 33 Schools*
Greater administrative flexibility	88
School can fulfill mission better	80
Tenure now more difficult	53
New faculty not academically prepared for tenure track	50
Decline in state support	41
More new faculty prefer nontenure track appointment	32
Decline in research funding	31
Fewer salary dollars needed for nontenure track faculty	25

*Deans of 33 of 50 schools reported more nontenure track faculty than in 1990. Multiple responses were permitted.

have a higher percentage tenured.² If only those faculty forty-nine years of age or under in nontenure track positions are considered, 80 percent are women compared to 54 percent males. Such differences are difficult to explain on the basis of age and relative numbers alone. Additional insight might come by knowing if the reasons given by deans as reported by Hunt⁶ for the increased use of nontenure tracks are applied differently to women.

Student and Faculty Diversity

Cohen⁹ has argued convincingly that diversity is important in the medical profession to achieve just and equitable access to rewarding careers, improved access to health care for the undeserved, and culturally competent care. Dental students need more minority role models and a better understanding of the diverse populations they will encounter in the workplace and in their patient populations. The traditionally disadvantaged racial minorities are significantly underrepresented in most dental schools. New strategies are needed so schools can successfully recruit more minority faculty members.

Enrollment in D.D.S./D.M.D. and graduate dental programs for U.S. dental schools, dental faculty, and the nation's population for the major racial groups in the United States are presented in Table 5. These data are from the American Dental Association's 1995-96 survey of dental educational institutions, which included the fifty-four dental schools in the continental United States and Puerto Rico that were operating in the mid-1990s.^{10,11} Underrepresentation of African-Americans, Hispanic/Latinos, and Native Americans

Table 5. Racial diversity in U.S. population, dental students, and dental faculty

	Percent in U.S.	Percent in D.D.S.	Percent in Graduate	Percent in Faculty
African-Americans	12.1	5.7	4.6	5.3
Hispanics/Latinos	9.0	5.8	7.2	3.1
Native Americans	0.8	0.4	0.2	0.5
Asian-Americans	2.9	20.7	15.2	6.4
Whites, others	75.2	67.2	72.8	84.7

is readily apparent when their numbers are compared to their proportions in the population. All three groups enroll in dental education programs and join dental faculties in lower proportions. Meanwhile, Asian-Americans enroll in a much greater percentage than their proportion in the population. The number of minority students enrolling in dental schools has increased significantly since 1990, but the increase is attributable almost entirely to Asian-Americans.

The racial proportions of faculty are less than those among the student body. Moreover, a majority of the faculty at Howard University and Meharry schools of dentistry are African-American, and a majority of the faculty at the University of Puerto Rico are Hispanic/Latino. Thus, among other dental schools, the degree of underrepresentation of the three traditionally underrepresented minorities is even greater than reflected in national data. Two major legal actions, *Hopwood vs. Texas* and Proposition 209 in California, have struck down affirmative action programs and policies regarding faculty, making it increasingly difficult to increase, or even maintain, diversity of faculty in the future.

Turnover of Clinical Faculty

The turnover of clinical dental faculty has remained at approximately 33 percent per five years since mid-1970.⁴ The reasons for faculty leaving academic life have changed over this period, with the percentage leaving academic dentistry in order to retire increasing from 17 percent to 37 percent. The next most common reason for leaving, approximately 27 percent, is to enter private practice. A comparable percentage go on to another academic institution. Faculty entering private practice is a special concern in that they are usually junior faculty with advanced training in whom the school has invested the resources necessary for them to begin an academic career. Appointment to a tenure track or a nontenure track position does not appear to

be a factor in retaining these junior faculty. A comparable percentage go on to another academic institution. The source of faculty accepting their first academic appointment also has remained relatively constant over time, with the greatest number (45 percent) coming from advanced dental education programs, followed by private practice (23 percent) and the uniformed services (19 percent).

Need for Faculty

A survey of dental schools in 1990 estimated a need for as many as 200 individuals to enter academic dentistry each year to meet the national demand for new faculty, with clear preference given to individuals with advanced training in a clinical discipline combined with training in clinical or basic research.⁷ This estimate was reaffirmed in 1995.⁴ A 1994 report by the National Academy of Sciences concerning the need for biomedical and behavioral scientists determined that training programs funded through the National Institute of Dental Research, with the combination of National Research Awards and Dentist Scientist Awards “supply, on average, fewer than one clinical scholar or potential clinical scholar per dental school per year.” The report further estimated a need to produce 260 graduates per year to meet the needs of dental schools and non-dental school institutions engaged in oral health research.¹² To meet this need, the National Academy of Sciences recommended that the number of training positions be increased from the 210 existing in 1993 to 430 by 1996. A similar recommendation had been made in 1985 by the National Research Council. Unfortunately, such levels of supported training positions were not achieved then or now.

The need for basic science faculty appears less acute, but not without problems. Dental schools are able to fill vacant basic scientist positions with well-trained individuals with good potential for competing for external research funding. What many of these individuals lack is an area of teaching expertise needed in the dental curriculum. For example, an individual trained in the complexities of molecular biology usually is not prepared to teach head and neck anatomy or basic human physiology.

While it is important to emphasize the educational and training needs of future faculty, it must be recognized that a segment of those future faculty already occupy faculty positions and their needs cannot be overlooked. The Report of the Pew Health Professions Commission recognized that many current faculty entered

academic dentistry at a time when enrollments were expanding, new schools were being established, and the emphasis was on teaching clinical skills.¹³ Without an investment in faculty development, these faculty will have a difficult time adapting to changing expectations as new concepts of academic productivity evolve.

Summary of Current Faculty Status

The number of faculty positions in dental schools has returned to the levels of a decade ago. Part-time clinical faculty contribute a significant proportion of the full-time clinical faculty equivalents. Public and private institutions differ significantly in the numbers of clinical faculty when compared by enrollment levels. The proportion of full-time clinical faculty occupying nontenure-track positions has increased as more dental schools adopt this type of appointment. The numbers of women occupying clinical faculty positions has increased, but they are more likely than their male counterparts to have a position that does not lead to tenure. Minorities are significantly underrepresented in both the student body and the faculty. The need for new faculty, especially those with the training and skills necessary to meet the demands on current faculty for increased productivity in research, is far greater than the opportunities for such training. At the same time there is a need to invest in the continued development of existing faculty. This is the current status of dental school faculty. The prospect that dental schools will face a critical shortage of clinical faculty in the future is real. How successful we are in making academic dentistry an attractive and viable career option will depend on both an understanding of the factors that influence career choices and the willingness of academic institutions to adapt.

Deterrents to an Academic Career

Dental schools searching to fill faculty and administrative positions frequently encounter a limited applicant pool. Searches have become more protracted, and a school typically begins an academic year with two to three budgeted clinical faculty positions that will go unfilled.⁷ This may seem like a small number, but for the average school² it represents approximately 5 percent of a segment of the faculty that devotes 50 percent or more of their effort to teaching.

Private Practice

Today's dental school graduates find themselves entering practice at a time when the number of active practitioners has peaked and begun to decline. The dentist to population ratio has been in decline since the late 1980. The number of dentists graduating annually has stabilized at about 4,000, and there is little reason to believe this number will change appreciably. Meanwhile, the demand for oral health care is increasing. In essence, the prospects for entering dental practice are extremely positive now and will continue to be for the foreseeable future.

Changing Expectations of Academic Dentistry

The environment of academic dentistry has changed significantly over the past decade. Increasingly, dental schools find themselves coping with significant financial problems and an expectation from their parent universities that they function more and more as independent financial units, the so-called "tub on their own bottom" theory. At the same time, universities in general and academic health centers in particular are looking for schools of dental medicine to be broad-based contributors to education, research, and patient care. These changes put increasing pressure on faculty not only to contribute broadly, but to share the responsibility for generating the financial resources necessary to support both the educational programs of the school as well as a share of their own compensation.

The Time Required to Prepare for Academic Dentistry

Graduation from dental school without additional formal training or clinical experience is insufficient preparation for a career in academic dentistry. This is evidenced by the fact that only a few first-time academic appointments are filled by individuals coming directly from dental school.⁴ The most sought-after individual is one who following graduation from dental school has completed clinical training in a specialty together with formal training in the basic or behavioral sciences leading to a graduate degree, preferably the Ph.D. Such preparation takes between five and seven years following graduation from dental school. Even this additional training and education do not guarantee success as the faculty member must compete with an

increasing number of individuals both within and outside dental schools seeking a relatively decreasing number of research dollars.

Income Differential

The income gap between those in academic dentistry and their counterparts in private practice is significant. In 1996/97 the mean guaranteed salary per half day for associate professors in the clinical sciences was the annual equivalent of \$77,300,¹⁴ while their counterpart, in private practice had an average nominal net income of \$134,590.¹⁵ Faculty income reflects only guaranteed annual salaries and does not include income from intramural private practice, consulting, etc. However, a faculty member's potential earnings from these sources is not sufficient to make up the difference, given the limited time that can be devoted to such activities and the expectation that clinical faculty will devote 50 percent or more of their time to didactic and clinical instruction. The prospect of increasing expectations for faculty members to generate a portion of their guaranteed compensation further compounds the problem.

Changing Nature of Academic Appointments

One of the most significant changes that has occurred in academic dentistry over the past two decades is the increased number of full-time clinical faculty occupying positions that do not lead to tenure.^{2,4} This trend reflects not only the change in institutional expectations for faculty, but a reluctance on the part of universities to make long-term financial commitments to academic disciplines that are seen as expensive. For the individual faculty member, especially the junior faculty, having their entire financial future dependent on an academic appointment without a reasonable available alternative must be of concern to those contemplating an academic career.

Indebtedness of Dental School Graduates

Students are graduating from dental schools with ever-increasing level of debt. This in part is due to significant increases in tuition as dental schools seek to compensate for the decreases in federal and state sup-

port and a limited ability to generate sufficient clinic revenues to make up the shortfall. Increasing indebtedness is not confined to dental graduates, but is seen at all levels of education. Thus, enrolling dental students come to dental school with higher levels of debt which then are compounded by the cost of dental education. The need to begin to pay back loans produces a sense of urgency to enter practice immediately upon graduation, thus adding to the reluctance to spend additional time and resources preparing for an academic career.

Summary of Deterrents to Academic Careers

Academic dentistry finds itself at this point in time with a significant need for well-trained and highly educated clinical faculty who can provide clinical instruction, conduct externally funded basic or clinical research, and generate a portion of their compensation

Table 6. Tracks for dental faculty and evaluation of performance

Track	Description/Evaluation
Clinician Scholar	D.M.D. with advanced training. Innovative teacher and active clinician. Participates in clinical research. Board certification or equivalent. Looks critically at what they do daily, asks questions, evaluates, and is an agent for change.
Dentist Scientist	D.M.D. with training in a specialty and Ph.D. Publishes works of impact. External research funding. Involves others in research.
Research Scientist	Ph.D. in biomedical or behavioral sciences and postdoctoral training. Sustained external funding. Original work with peer recognition. Facilitates others' involvement in research.
Full-Time Clinician	D.M.D. with advanced training. Recognized as a highly skilled clinician. Primarily involved in patient care and/or clinical teaching. May participate in clinical research. Board certification if applicable or equivalent. Quality of care and/or instruction are measures of success.
Research Development	Ph.D. in biomedical or behavioral sciences. Supported by research funds usually on a senior investigators grant. Objective is to become independent.
Administrative	Dean, Assoc. Dean, Dept. Head. Expectation for teaching and scholarship in proportion to administrative effort.
Emeritus	Re-employed retired faculty. Specific assignment usually clinical teaching. Renewable annual or fixed term contract based on performance and need.

through salary on grants and/or private patient care. Their potential to achieve tenure is less than it was for current senior faculty, since the number of tenurable positions has declined. At the same time, the difference in levels of compensation between academic dentists and their counterparts in private practice is significant. The need to commit additional time and resources to the additional preparation required for an academic career conflicts with the need to begin to retire student debt. The authors will concede that the picture painted above is pessimistic and perhaps somewhat overstated for today, but it will be the reality in the decades to come unless there is change.

Creating a More Favorable Environment for Academic Dentistry

Based on what is known about the present status of dental school faculty and the existing deterrents to pursuit of an academic career in dentistry, it is reasonable to predict of a significant lack of well-qualified clinical dental faculty in the near future. The changes needed must be of sufficient magnitude to realistically address the problem. Several strategies are suggested.

Reconceptualize the Dental School, Its Departments, and Its Individual Faculty

The time is long gone, if in fact it ever existed, when the every member of the clinical faculty would be expected to be current in his or her clinical discipline, transmit knowledge and experience using the most advanced pedagogical methods and technology, be engaged in cutting-edge research, and as the master clinician, be an effective preceptor for students and exemplary provider of patient care. A reconceptualization

Table 7. Distribution of effort (%)

Track	Teach	Scholar	Service	Other
Clinician Scholar	50	varies	15	35
Dentist Scientist	20	50	15	15
Research Scientist	20	50	15	15
Full-Time Clinician	10	none	none	90
Research Development	10	90	none	none
Administrative	20	varies	65	15
Emeritus	100	none	none	none

of the dental school must begin with a shift in the unit of measure of productivity from the individual to at least the department, if not the entire school. Basic to this shift is an underlying premise that each faculty member will make a meaningful contribution to the achievement of the institution's expectations. Even though the contribution may be significantly different for each individual, all contributions will be equally valued and rewarded on the basis of quality. One mechanism to achieve such an end would be the continued development and refinement of clearly defined tracks reflective of the multiple dimensions of a dental school mission and structure organizational units such that the combination of types of faculty reflect expectations. An example of such full-time faculty tracks is presented in Table 6 and is derived from a concept employed in academic medicine¹⁶ and a synthesis of existing approaches used in some dental schools and consistent with that described in Table 2. This concept is also in keeping with the recommendation in the Institute of Medicine's comprehensive review of dental education which called for greater flexibility in the use of types of faculty appointments as a means of better achieving educational, research, and patient care objectives.⁵ The descriptions of the various tracks are by no means complete but are intended to provide a sense of how one track differs from the others. Table 7 provides an example of how individuals in such tracks might distribute their effort.

The question of whether any, all, or some of these tracks should be academic appointments per se, lead to tenure, or be nontenure fixed term contracts is dependent on a number of variables that range from the tenure policy of the parent institution to source of compensation. No one approach would be applicable to all. However, there is one principle that is applicable to all. If the contributions of individual faculty to accomplishing the school's mission, although they be different from one another, are to be equally valued, then the degree of security afforded faculty in different tracks should be comparable.

Defining Full-Time Status

As described previously, the proportion of faculty positions leading to tenure in the United States dental schools is decreasing and being replaced by nontenurable full-time appointments, while a substantial portion of clinical instruction is provided by part-time clinical faculty. If dental schools are to attract sufficient numbers of clinical faculty to meet the needs of

their educational programs, perhaps it is time to look differently at what it means to be full-time. The concept of geographic full-time faculty, an appointment for less than five days per week, is found at many medical schools and a few dental schools. Schools should consider employing individuals three or four days per week, providing them the full range of fringe benefits and expect that they will engage in extramural practice. The advantage of this arrangement to the faculty member is that, should circumstances change and their appointments not be renewed, they will not be without a means of support. A measure of security would be provided by making such appointments for fixed terms of three to five years.

To the extent that dental school administrators need more administrative flexibility or have concerns about the ability of faculty to obtain tenure at their institutions, a review of their policies on nontenure appointments would be in order. By employing more nontenure clinical faculty and fewer tenure-track faculty with a clinical emphasis, such appointments would permit these faculty members to concentrate on the clinical teaching and patient care where they have their greatest strengths and interests and the time for preparation is less. At the same time, they could avoid the requirements of original research, grant writing, and scientific publication.

In the future, dental schools are likely to expand the recruitment of two types of faculty members: Ph.D. scientists into a research track and skilled clinicians into a clinical track. In this emerging faculty model, both groups will be expected to increase the flow of revenue to the schools. The scientists will devote most of their effort to scholarship and be evaluated and rewarded on their ability to secure significant external research funding. The skilled clinicians, who may be dental specialists or generalists, will devote most of their effort to clinical teaching and clinical practice. Assuming the present model is maintained, they will draw a base salary, but most of their compensation will be based on their ability to generate a significant portion of their salaries through not only clinical revenues from dental faculty practices, but from increased student clinic productivity. Some dental schools are currently developing financial incentive plans whereby portions of student-generated revenue become available to the attending faculty members and their departments.

Compensation

An extension of the concept of equally valuing for academic purposes all faculty effort that contributes meaningfully to the overall objectives of the department and school is the idea that, although society may compensate one type of activity more than another, the two are of equal value to the institution. A compensation scheme that also represents a synthesis of plans existing in some dental schools is presented in Table 8. The principle of equal value is particularly applicable to the “Y” component where all faculty are intended to benefit equally but not necessarily in proportion to their contribution. For example, one member of a department may spend a day providing a consulting service for a private company, while a fellow faculty member covers an undergraduate clinic. One activity is consistent with the service component of the school’s mission, while the other activity supports the missions of quality patient care and instruction. The private company pays a consulting fee far larger than the clinic revenue generated by the students working under faculty supervision. The additional income generated through consultation should be placed in a pool to meet the “Y” component. At the same time, high financial productivity on the part of individual faculty can be recognized by the “Z” component.

Over the past twenty years there has been a gradual shift from allowing full-time faculty to engage in extramural practice to limiting their practice to a school-sponsored intramural activity. If schools hope to close the gap between compensation in academic dentistry and private practice in the future, they must reassess this practice restriction and objectively determine whether it constitutes a viable option. If an intramural practice cannot provide a level of compensation equivalent to what could be earned extramurally for

equal effort, then the restriction should be abandoned and faculty given the opportunity to use the time formerly allocated for intramural practice in a way that is most economically efficient for them.

Debt Forgiveness

Examples exist in which loan forgiveness is part of the compensation in return for service to the underserved and as an incentive for minorities to engage in teaching. In recognition of the anticipated shortage of clinical dental faculty, organizations representing practitioners and academicians alike must aggressively pursue legislation that will provide an incentive in the form of loan forgiveness for those pursuing a full-time academic career.

Other Sources of Faculty

In general, U.S. dental schools look to U.S. graduates as a source of faculty. For a variety of reasons, not the least of which are restrictions imposed by licensure, many dental schools cannot consider dentists trained and educated in other industrialized countries as potential faculty. In order to expand the pool of potential faculty, efforts must be made to remove restrictions that inhibit highly qualified foreign faculty from accepting appointments in U.S. dental schools. These changes should be such that the foreign dental graduate has all of the prerogatives in terms of an academic career as his or her U.S. trained colleague.

Other Incentives

Academic dentistry is now, and will be more so in the future, in competition for the best and brightest to join the ranks of faculty, be they full-time, part-time, or some new hybrid. Whatever motivated current senior faculty to chose an academic career is not wholly applicable today. This is a different time and a different generation with different values and lifestyles. No worse nor better than their predecessors, just different. Academic dentistry must change and senior faculty must be willing to embrace change, if an academic career is to be attractive. For example, given that women now make up 37 percent of graduating classes, it is reasonable to assume that their representation on dental faculties will increase from the present 18 percent. It is also likely they will be part of a two-income household, as will the male faculty member. Major employ-

Table 8. Compensation	
“X” component	Guaranteed base salary for contribution to academic program. Derived from a stable source of revenue (e.g., tuition, state funds). May be fixed by academic rank and length of service.
“Y” component	Guaranteed annually. Can vary each year. Based on income previously earned. Clinical practice, student clinic financial performance, salary on grants, consultation fees all contributing to a department-based pool.
“Z” component	Same sources as “Y.” Intended to be an incentive for exceptional producers. Applies mostly to clinical revenue from private practice.

ers have addressed these issues by providing day care, flexible work schedules, and menus of fringe benefits so that employee and spouse can avoid duplication and select those benefits that meet their circumstances. Would a dentist in private practice be more inclined to teach two or more days per week if their compensation included health insurance coverage similar to full-time faculty, library and Internet access, an e-mail account, or tuition remission? Academic dentistry and their parent institutions must come to think more like the company that employs highly skilled people drawn from a limited pool of workers.

Conclusion

An assessment of the environment of dental practice and that of academic dentistry leads to the reasonable conclusion that dental schools will face a significant shortage of clinical dental faculty in the future. A variety of actions need to be taken if the current deterrents to pursuit of an academic career are to be minimized. The unit of measure of productivity in dental schools must shift from the individual to the department or school with each individual's unique contribution being equally valued. A variety of faculty tracks, reflective of faculty expectations, need to be developed. Consideration needs to be given to a category of faculty, who devote a significant portion of their total effort to academics while at the same time conducting an extramural private practice. Similarly, schools must be willing to assess objectively the potential of their intramural practice programs to return benefit to faculty commensurate with the portion of their time allotted. Not only must the number of governmentally supported training opportunities be increased, but government must also look to loan forgiveness as further incentive to pursue an academic career. Current faculty must be supported in their effort to acquire the knowledge and skills necessary for them to satisfy changing expectations for productivity. A special effort is required to attract women and minorities to an academic career. All barriers, particularly those related to licensure, must be removed so that dental schools can expand their faculty recruitment efforts beyond the United States. Future faculty must find a career in academic dentistry to be one that is structured and includes appropriate incentives to allow them to achieve both personal and professional goals.

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