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Some clinical truths are harder to accept than others. They challenge dearly held practice convictions and require courage and forceful resolve to absorb their implicit inconveniences into routine practice. The discipline continues to require enlightened and imaginative leadership to deal with this difficult remit while ensuring a benchmark of high professional standards with global implications. To date, we have all been beneficiaries of the necessary and ongoing shifts in the applied scholarship agendas of service, education and research, as we continue to seek collective responses to current inconvenient truths.

I joined our discipline's clinical academic community during the twin solitudes era of the 60s. Prosthodontics was then arbitrarily divided into those who 'did pink' (removable) and those who were resolute in their determination to avoid it at all costs (fixed). The split was routinely underscored at numerous meetings where examples of clinical and laboratory virtuosity provided much scope for brilliant pictorial presentations. In those days, there was little mention of possible expiration dates for clinical ingenuity; and in retrospect it appeared that treatment decisions often precluded serious concerns with long-term outcome criteria. (The memory of so-called periodontal prostheses still lingers as a bizarre example of important oral rehabilitation achievement). Gradually, traditional materials science and laboratory skills merged with stronger biological concerns and led to subtle if profound shifts in dentist and patient mediated perceptions. It remains tempting to regard Branemark's research in Osseointegration as the catalyst for a near overnight convergence of prior scholarly initiatives culminating in the discipline's ensuing giant leap of clinical science. The related chapters of Prosthodontic mindsets rapidly coalesced into a single narrative as treatment challenges (more often dilemmas) were confronted with a far better answer to the perennial question—what is the ecological price implicit in both the predicament of teeth loss as well as its management? The question's implied inconvenient truth was met head-on with a new dimension of scientific clinical rigor. Consequently, clinical teachers of my vintage, together with our mid-career colleagues, have been fortunate indeed to preside over an educational and practice era wherein the risk of treatment anarchy was finally countered with better evidence-based clinical decisions. The individual clinician's claim to being the single hegemon was challenged by wide and new intellectual capital culminating in hopes for an even more exciting era of ecologically sound dental therapy.

Regrettably, the old traditional dentistry habit of promoting technology without strong scientific underpinnings continues to die hard, even in our discipline. The integrity of purpose and scientific rigor that characterized the original Osseointegration clinical research has been largely discarded as passé. Partnerships with commercial enterprise now dominate continuing education. The educational thrust is based on a veritable catwalk of implant designs and their presumed impact on the timing of occlusal loading protocols and technique-driven agendas which underscore the superiority of a near-robotic approach to managing patient needs as opposed to the specialist's traditional modus operandi. New lecture circuit celebrities keep being recruited to promote osseointegration's newer and expanded promise, albeit it falls significantly outside the technique's initial oral ecological context.

I hasten to acknowledge that such medical marvels as endoscopic surgery and robotically-performed orthopedic replacements continue to elicit wonder and gratitude for the scholarly and commercial synergies which created them. We in Prosthodontics have been in the 'biological spare parts' business for a very long time but without having to face the serious hazards which continue to confront our medical colleagues. And our extraordinary OI treatment advances are very much the result of comparable synergies in the pursuit of a better world of patient care. However, the risk of yet another anarchic phase in treatment decision making has resurfaced. The resultant inconvenient truth here is that our disinterested and open-minded quest for truth in clinical progress risks being compromised and ultimately subverting the public interest. We are confronted with the predicament of becoming inadvertent handmaidens of industry by subscribing to complexity in the name of technological advances, and surrendering to data which promote products without long-term outcome information. Above all, we risk overlooking safety, simplicity and prudence in our clinical judgment.

The recent news regarding the content and quality of "outsourced" materials used in routine laboratory protocols in prosthodontic treatment underscores the ambivalence of our professional predicament. It has sent shock waves through the ranks of both the profession and the discipline's best longstanding partner, the Dental Laboratory Industry. It is an inconvenient truth of alarming proportions and demanded an invited Commentary on the subject from a highly respected clinical scholar. Dr Gary Goldstein's essay is a lucid and articulate analysis of a serious challenge to our professional judgment and conduct. It is a stark reminder that whatever ethical bed we make, we lie in.

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Who does your laboratory work?

You have dialed the toll-free number, waded through the numerous options and menus, and sat on hold for the last 20 minutes listening to monotonic, monotonous elevator music. Are you waiting to talk to an outsourced technology support for you computer? No, you are waiting to speak to your laboratory technologist to discuss a problem with a prosthesis that was just returned. Sounds far-fetched? It is not. Outsourcing of dental laboratory work is a fact of life in the United States and other countries. The American Dental Association (ADA) News (May 15, 2006) estimated that 10% to 15% of the restorations—5 million, mostly crowns—were produced offshore, and this number should rise to 7 million when the 2007 data are in.

So, what is the problem? Well, the explosion of restorative dentistry—including implant and esthetic dentistry—in the last 30 years was made possible by a close, mutually respectful relationship between dental clinicians and laboratory technicians. Clinicians with in-house labs are prime examples of this situation and can attest to its efficacy; however, the vast majority of clinicians use commercial laboratories, which are usually located nearby. There are many advantages to geographic proximity: custom staining and shade selection assistance, quick repairs, and the ability of the practitioner to visit the lab or the technician to visit the office to discuss a difficult prosthesis or plan a difficult esthetic design. This model has resulted in quality fulfillment of the restorative needs of our patients, but the model is disintegrating.

Currently, domestic dental laboratories are facing myriad challenges. Since I am most familiar with the US model, let me try to describe what is happening here.

Predoctoral dental education

Most of the challenges stem from a shift in the curriculum of dental schools, which have drastically reduced the number of clock hours required for dental students in the area of dental laboratory studies and prosthodontics. Over the past 20 years, prosthodontics—as a practiced specialty and as a discipline in dental schools—has been steadily declining. Although many of the basic tenets of the rapidly emerging treatment areas of esthetic and implant dentistry depend on a thorough knowledge of the basic prosthodontic concepts, many dental schools have reduced, and in some cases, eliminated altogether, the prosthodontic requirements for graduation.

At the Second Advanced Dental Education Summit of the American Dental Education Association, held in Baltimore, Maryland, from December 7 to December 9, 2006, the educators present lamented the clinical experience of current graduates and passed a resolution requiring a mandatory PGY1 for licensure. Undergraduate students now have limited exposure to prosthodontic knowledge and techniques, resulting in a lack of experience and clinical competency in these important areas. This has resulted in students who may have never performed laboratory procedures, may not be competent to evaluate a returning prosthesis, may have never met a laboratory technician, and may have no sense of the value of a laboratory technician. Technicians are now, more than ever, forced to make decisions regarding designs and products that were typically a clinician's responsibility. As explained by Afsharzand et al,[1] "Most dentists rely on the dental technician to choose the materials needed for the fabrication of the prosthesis. With lack of adequate information, all too often the design, fabrication, and completion of the case is left up to the technician. Therefore, our results indicate an apparent trend to which technicians are left to make crucial decisions for dentists."

The decline in the knowledge and practice of prosthodontics adversely affects not only the future of the discipline and its place in dental schools and dentistry as a whole, but also the rising number of patients requiring this type of care. If this decline continues, millions of Americans will feel the effects of the shortage of trained practitioners, leaving their needs for prosthodontic treatment unmet. This impending shortage will have the biggest effect on our most vulnerable aging population and their quality of life.

US population oral health needs

Limited access to prosthodontic services is becoming a real and growing threat for aging US citizens. Research shows that population growth among the primary age groups requiring prosthodontic services is expected to increase significantly over the next 30 years. In 1991, 33.6 million people in the United States required complete dentures. By 2020, that number will escalate to 37.9 million adults.[2] In 2000, 12.4% of the US population was 65 years of age or older. This number will increase to 16% by 2020 and 21% by 2050.[2] The fastest growing segment of the population is the group over 85 years of age. According to the US Census Bureau, there were 5 million seniors aged over 85 years in 2005, and this number is expected to reach 20 million by 2050. The growth of this age group will substantially increase the demand for fixed, implant, and removable prosthodontics. In the United States, more than 40% of those over 65 are completely edentulous.

There are currently 178 million partially edentulous US citizens. Public health data show that the number of partially edentulous patients will continue to increase over the next 15 years to more than 200 million individuals. Partial edentulism affects the majority of adult US citizens, and as a result, the need for fixed and removable partial prosthodontic care will increase.[2] Douglas et al,[3] using the percentage of time the average general practitioner spends performing fixed and removable partial prosthodontic care and the percentage of time spent on all care by prosthodontists, calculated the need for services of this population. They estimated that the unmet need for care will increase from 488 million hours in 2005 to 560 million in 2020. This is a significant issue that will impact the quality of life for many Americans. These facts have not been lost on the denturists, who while legal in some states, are the purveyors of illegal dentistry in others. In New York, the public data shown above are being used to convince the state legislators that there is a need for "denturologists" who are nondentists trained to carry out both complete and removable partial dentures.

Dental technology education

There has been a drastic reduction in the number of dental technology schools accredited by the Commission on Dental Accreditation (CODA), from a high of 58 in the 1980s to a current low of 20. There are many reasons for this: the cost of CODA certification, the CODA requirement that all five laboratory specialties (crown and bridge, ceramics, partial dentures, complete dentures, and orthodontics) need to be taught, finances, and a lack of faculty due to the requirement that a faculty member must be at least one degree level higher than the degree they are teaching, and unfortunately, there are not adequate BS degrees available to the educators. The National Association of Dental Laboratories estimates that there are currently 48,000 full- or part-time laboratory technicians in the United States. Twenty-eight percent of certified dental technicians (those who have passed two written tests and one hands-on examination in their specialty) are over 55 years of age, and 43% are between 45 and 54 years. It is projected that 11,000 technicians will be leaving the industry in the next 7 years. The problem is that the current technical schools can only train 1400 technicians in the next 7 years, which will result in a lack of qualified individuals to make those same treatment decisions that have been relegated from the clinician to the technician.

Outsourcing

So, if over 1 billion dollars of laboratory work is heading offshore, where is it going? It appears that the majority is being shipped to China, which has already had a bit of a public relations problem with a variety of products.

A major concern for dentists is a very recent investigative report by the CBS television affiliate station in Cleveland, Ohio, based on a lawsuit by a woman who is claiming adverse reactions caused by lead (160 ppm) in a maxillary 3-unit fixed partial denture manufactured in China. The station, working with a local dental clinician, sent out eight porcelain-fused-to-metal full-coverage restorations to four different laboratories in China and then had them tested. The results showed one crown with 210-ppm lead contamination in the porcelain. The investigation and subsequent reporting were unbiased and professional. It is a tribute to their high standards that a mass hysteria has not occurred; however, by the time you are reading this editorial, that may no longer be the case.

I wear a Swiss watch, drive a Japanese car, and write with a French pen. I love Italian wines (with a tip of the hat to Argentinean Malbecs for price and quality), Spanish olives, and French cheese. Most of my clothes, shoes, and household wares are imported. We live in a globalized economy and are better for it. Global economics has been an accepted fabric in dentistry for years, with Astra, Dentsply, 3M ESPE, GC, Ivoclar Vivadent, Nobel Biocare, and numerous others having long and successful international histories. The issue is this: I know where all of the things I wear, drive, use, and eat are made, but that is not the case with outsourced dental prostheses. Clinicians do not know when their laboratory work has been outsourced, so how can the patient know? If you prescribe a specific brand, how do you know it was actually used to manufacture the prosthesis? If there is a problem, how will we track the source? Who will do the recall? How do you recall cemented or bonded restorations?

It is illogical that a label of origin is mandatory for my tie, which I wear every other week, but not for a restoration that will hopefully remain in my mouth every day for many years. The clinician and patient have the right to know when their work is outsourced, and they have the right to know now. If there is nothing wrong, there is nothing to hide. The place of manufacture should be listed on all prostheses.

Now the circle closes. Dentistry has brought this on itself. We are reaping the penalty of graduating students with poor training in the discipline of prosthodontics and no knowledge of the value of a laboratory technician. We have a declining number of trained technicians and increasingly aggressive third-party payers who are altering the normal fee for service and patient–doctor relationship and forcing the "business" of dentistry to seek less expensive alternatives.

Where will we end up if there is no change in the current educational paradigm? Most of the restorations will be outsourced overseas. There will be a small cadre of trained technicians who will service a small number of highly trained clinicians who will treat a small number of elite patients with the resources to pay for specialized care. The question then is what will be the quality of the outsourced restorations delivered to the bulk of our population when the outsourced market engulfs the industry and the average practitioner has no alternative? Where does your country stand on these issues?

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