The Globalization of the Dental Laboratory Industry

The current state of the American Dental Laboratory industry is of great concern to professional leadership, yet remains vaguely understood by the average clinician.

The purpose of this Perspectives feature is to shed light on the issues affecting patient safety and professional liability.

I have enlisted the expertise of the Executive Director of the National Association of Dental Laboratories (NADL), Mr. Bennet Napier, CAE. He is an expert on this topic and served as an invaluable resource for hard data on this subject.

LABOR SHORTAGE

The rapidly diminishing labor pool of qualified technical talent is at a catastrophic level. This decline has led many larger stateside laboratories to develop in-house training programs to develop their workforce from introductory to advanced levels. Unfortunately, this practice is restricted to the individual lab and has little consequence on the profession overall.

US INDUSTRY STATISTICS—2010

Technicians

- 33,600 dental technicians (down from 43,000 in 2008)
- 6,500 Certified Dental Technicians

Source: NADL Market Research, US Census Data, US Department of Labor/Bureau of Labor Statistics

Average Age of Remaining Techs by Specialty

Unfortunately, there is no good source for this question, although the NADL intends to survey the market in 2012 to gauge the average age. What we do know with certainty is that the smallest pool of dental technicians (trained) are in removable and orthodontic services.

Laboratories

- 10,000 dental laboratories (down from 13,500 in 2008)
- 1,600 NADL members
- Nearly 80% of NADL members are small laboratories
- 6,000 laboratories have a single technician
- $632,000.00 in average annual gross sales per dental laboratory nationally

Source: NADL Market Research, US Census Data, US Department of Labor

Disappearing Accredited Dental Laboratory Technology Programs

This problem is compounded by the fact that no backfill of talent is in the academic pipeline. The number of Accredited Dental Laboratory Programs in the United States has dropped from 58 in 1989 to 18 today, graduating approximately 350 students a year.

Reduced Military Dental Technology Training

According to Col Richard J. Windhorn, Commander of the US Army Dental Laboratory, The US Armed Forces trained an annual average of 800 technicians in 1993. That number today is reduced to 128 new technicians per year for all three federal services.

In the past, many of these individuals retired into the private sector as faculty in accredited programs as well as technicians and managers in many laboratories across the country. Now that strong talent pool has been reduced.

Lack of Adequate Advanced Training

Advanced training has been largely restricted to the area of esthetic dentistry. The manufacturers' interest in marketing and selling products has fostered a great deal of high-level education for ceramists from the

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well-known specialized institutes and professional organizations. The Advanced Esthetic Dentistry for Ceramist Technicians program led by Dr. Ed McLaren at UCLA is an excellent example of what can be done. The American Society of Master Dental Technologists program at NYU is a regional effort that provides an opportunity for advanced training. LSU provides a unique learning environment allowing the technician to team with dental students working directly with patients in restoring cases.

These excellent programs are far too few in number to meet the future needs of the profession.

OFFSHORE PRODUCTION

Easily accessible worldwide shipping networks have opened markets for all types of medical devices. As is typical, the dental market trails medicine due to the smaller comparative sales volume. Indirect dental restorations are now a major focus of manufacturers in countries with significantly lower labor costs. Extremely large operations employing up to 4,000 people now exist in Southeast Asia. These entities vary greatly in quality and materials used for fabrication. That being said, it is foolish to assume that all of these laboratories do substandard work.

First Major Dental Manufacturer Purchases Offshore Laboratory

The recent purchase of at least one of these operations by a highly reputable US-based dental manufacturer is of interest. Their reasoning for the purchase was to reverse the loss of sales of their ADA accepted materials in that market. They control all materials used to meet ADA accepted status. The objective is to provide a reliable outsource option exclusively for their dental laboratory customer base in this rapidly developing market segment.

Direct Sale of Offshore Restorations into Local Markets

Another, more alarming scenario of definite concern to US laboratories is a Southeast Asian manufacturer that has set up facilities in major US cities and sells directly to dentists only.

FDA REGULATION

The FDA is faced with an overwhelming volume of medical device imports and ridiculously low resources for adequate enforcement.

Import Posture for FDA

- Fiscal Year 2010: 20 million shipments of FDA regulated imports
- US Government Accountability Office report to Congress in 2010 indicated only 8% of shipments are being inspected
- Budget request for additional $70 million in funding to increase at-port inspections of imported products

Appropriate Disclosure

An alarming number of US laboratories are selling offshore work to dentists without proper disclosure. The FDA has regulations in place that require disclosure of the origin of fabrication in the packaging of the restoration in a conspicuous place. The regulations also include any part of the process, preventing laboratories from subcontracting the majority of the process and "finalizing" stateside without proper disclosure.

Dental Crowns Being Made Overseas

❖ 2006 Total Domestic Crown and Bridge Market was 33,458,641 units, manufactured offshore 6 million units (17%)

❖ 2008 Total Domestic Crown and Bridge Market was 37,214,886 units, manufactured offshore 10 million units (26%)

❖ 2010 Total Domestic Crown and Bridge Market was 39,476,350, manufactured offshore 15 million units (38%)

❖ Source on Total Units: iData Research 2010, Import Trade Data from US FDA

❖ Source on Number of Units Manufactured Offshore: NADL Cost of Doing Business Surveys, 2006, 2008, 2010 (sample of 1,000 US dental laboratories on

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offshore production or outsourcing) as conducted by Valmont Research

Dental Laboratory Data for Import Restorations 2010

❖ NAICS codes comprise the medical devices industry that is covered by the Office of Health and Consumer Goods (OHCG) based on FDA 2010 data, total medical device imports for the United States was $33 billion

❖ According to the FDA data, dental laboratories account for about *4%* of import total measured by value of shipment (VOS) including crowns, dentures, bridges, and other orthodontic products.

❖ Four percent equals $1.32 billion. If you use NADL data on US lab sales, the percentage is 20%. Again, this is percentage of sales not units. If you use units as the measure based on average offshore price point, it is estimated to be 35% of units.

The Offshore Outsource Market

Outsourcing from an Asian perspective started in Singapore with several entrepreneurs developing outsourcing labs to meet a market demand for insurance based programs for the German market. Most export labs in Asia are actually owned by Taiwanese, not native Chinese. The Chinese government provides tax incentives for export labs. In most cases, gross sales are tax exempt for the first 2–3 years. The government also provides tax incentives for employee training and recruitment.

There are approximately 25 large export labs in Asia. However, with that said, there are over 30 countries with foreign dental laboratories importing work into the United States, and there are over 75 export laboratories in China registered to import into the United States.

The majority of dental technicians in this area are female and between the ages of 18–25. A typical career duration in the large labs is 7–8 years. After that, technicians may leave and go back to their hometowns to practice dental technology in domestic labs. China is currently facing 15% inflation. The Chinese government has put out a mandate that employers increase worker wages by 20% over the next 5 years.

Two Examples of Many Major Asian Laboratories

Laboratory 1

The majority of their customer base is European. Only 10% of export sales are to the United States currently. Their push into the US market started in 2009. Their sales have reportedly grown 20% since 2010. The business model is to grow their footprint in the United States through laboratory acquisition and opening additional sales centers. They currently have operations in Washington, California, Massachusetts, and Illinois.

At the main Asian manufacturing location, there are reportedly 2,000 technicians working two shifts a day (last shift ends at 11 pm or midnight). Campus is 20,000 m^2.

To our knowledge, as of September 2011, they had not been inspected by the US FDA. Reportedly, they have been inspected regularly by the French FDA equivalent.

They recruit technicians primarily from the countryside. They have an extensive training process, and students get paid during the training process. Nearly 50% of students stay on after the initial training. After 3 years, 30% of the class is still employed there.

Laboratory 2

This laboratory reportedly receives 6,500 units per week. This laboratory sells crowns at an average price of $35.00. Other emerging markets like Vietnam are home to export labs selling crowns at $12–15. At a $12–15 price point, one could speculate that FDA-approved materials are not being used.

There is discussion of subcontracting cases to laboratories in lower priced markets (Thailand) to control their rising labor costs. This practice is further evidence of the globalization of the industry. They also are reportedly planning to acquire several $5-million-dollar-sized US labs to be stateside regional customer service/distribution centers.

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CONCLUSIONS

The factors presented in this paper combined with a sagging global economy and continuously increasing third-party reimbursement sources are creating previously unseen downward price pressure on the world laboratory market. This observation does not bode well for the short-term resolution of the US laboratory academic crisis. Investment from organized dentistry and the manufacturing community are crucial but perhaps unrealistic requirements to turn this tide.

DISCLAIMER

The views expressed in this feature are solely those of the author and do not necessarily represent the opinions of the *Journal*, its Editors, or staff.

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