Dental CAD/CAM technology offers productivity, increases worldwide

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New York, NY, USA, and Van Court, BC Canada-CAD/CAM technology is undoubtedly one of the most important developments in dentistry today. Especially on the lab side, CAD/CAM technology is expected to increase productivity, enabling labs to meet the growing demand for dental prosthodontics and other restoratives. This growth is a result of the aging population and the increasing demand for improved dental aesthetics. CAD/CAM technology has met challenges in satisfying dental laboratories' expectations of what this technology will bring to their businesses. However, the technology is evolving at a rapid pace, as new trends and technological opportunities are emerging, representing the potential to surpass what it had initially offered dental laboratories.

While a large and growing portion of dental technicians prefer to use all-ceramic over conventional materials, all-ceramic acceptance has been met with resistance from dentists. All-ceramic materials have had average failure rates, with limited long-term clinical data to validate their durability and reliability. As a result, conservative dentists have continued to rely on traditional materials such as PFM. However, the use of zirconia has greatly increased the overall durability of all-ceramic materials, as zirconia is stronger material than porcelain.

Despite the initial resistance, it is expected that zirconia will continue to gain popularity as CAD/CAM manufacturers invest in research and development of zirconia for durability as well as to encourage its use through the education of dentists and lab technicians.

Zirconia drives CAD/CAM adoption

Zirconia is the primary driver of CAD/CAM adoption, as the material can be milled into a crown or bridge only through an automated device, most often a CAD/CAM system. Zirconia's biocompatibility and high aesthetic qualities have led to a rapid increase in its use for dental prosthetics. For example, the number of all-ceramic dental prosthetic units is projected to grow at a CAGR of 10.8 per cent and 10.5 per cent in the United States and Europe, respectively, over the next five years. This is well above the growth rate of other materials, such as porcelain fused to metal (PFM), which will see relatively flat growth.

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CAD/CAM is a viable replacement for lab technicians

While zirconia has traditionally been the primary driver of CAD/CAM adoption, cost and production efficiencies are becoming more important factors. CAD/CAM technology is becoming more flexible and high-quality life in the type of services that can be offered to dental laboratories. This is especially crucial as the number of dental laboratories worldwide is projected to drastically decline in the future due to the large number of older and retiring dental technicians.

In addition, there are fewer dental technicians entering this field due to insufficient monetary compensation. This reduction in work force numbers coupled with the increasing demand for dental restorations brought on by the aging population, will create greater demands on dental laboratories’ production capacity for prosthetics and other restorations. Dental laboratories in the United States and Europe are also under strain due to competition from countries with very low labor costs such as China, Morocco, Turkey and Costa Rica.

Stand-alone scanning units offer a cost effective solution

The vast majority of dental laboratories around the world em- ploy less than five dental technicians. Many of these laboratories hardly have enough volume to warrant the purchase of an expensive CAD/CAM system with house milling capabilities. To reach the smaller players in the market, CAD/CAM manufacturers such as 3M ESPE, DENTSPLY and Nobel Biocare have offered scanning units to dental laboratories, enabling the lab to scan and outsource the digital restoration to be milled at another location (either a centralized milling facility or dental laboratories with in-house milling capability).

This purchasing option allows laboratories to create sufficient volume and re- venue to invest in a full CAD/CAM system with house milling capability, whereas smaller to medium size laboratories can invest in a lower cost scanning unit, simultaneously eliminating the need for training and education costs of dental copings and frameworks.

Full CAD/CAM systems typically involve one scanner unit and one milling unit in-house. A stand-alone scanner CAD/CAM system consists of only a scanner unit, which can be connected to an additional automation to either a centralized milling facility, or dental laboratories with in-house milling capability. The growing popularity of the two purchasing options is evident in the US and European markets, as there is an approximate ratio of one full CAD/CAM system to two stand-alone scanners in the total installed base.

Prices for CAD/CAM systems continue to drop

Prices for CAD/CAM systems continue to drop as the industry is becoming increasingly more affordable to dental laboratories as their prices progress. For example, the average selling price for full systems and CAD/CAM systems are expected to drop at CAGRs of 4.9 per cent and 4.3 per cent, respectively. Manufacturers and distributors are offering financing programs to help laboratories acquire the systems and, in some cases, are giving the systems away for free on the condition that the lab manufacture a certain number of prosthetics or prosthetics.

Likewise, the cost of the copings and frameworks milled by CAD/CAM systems are rapidly dropping. This drop in price creates sufficient volume and revenue to invest in a full CAD/CAM system with house milling capability, whereas smaller to medium size laboratories can invest in a lower cost scanning unit, simultaneously eliminating the need for training and education costs of dental copings and frameworks.

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