Dental Implants: 101

You want to get started with implants but you don’t know where to go? Check out this terrific resource and we will give you the answers to this question and more.

by Thomas Giacobbi, DDS, FAGD
Editorial Director, Dentaltown Magazine

As more and more patients become aware of the dental implant restorative option, more and more dentists are deciding on whether or not to incorporate it into their practices. Dentaltown Magazine interviewed 11 companies that manufacture or offer education courses on placing dental implants to learn more about the different implant systems on the market, as well as what can aid placement predictability and whether general practitioners should or shouldn’t be placing dental implants.

How did your company become involved in developing implants?

Rodriguez (Astra Tech): Astra Tech was established in 1948 and started out as a wholesaler of hospital products. In 1978 the company transformed into a medical device manufacturer with highly qualified in-house research and development resources. From that point on we have had a clear focus on the development of advanced products and concepts for the dental and health care sectors. As a company in the AstraZeneca Group, access to resources and experiences in the field of research and documentation, as well as those disciplines connected with legal, environment and patent issues is ensured.

Astra Tech Dental Implants offer unrivaled documented results for maintaining marginal bone integrity and soft tissue health, with several features that work together to help prevent bone loss and ensure implant stability after placement. To maintain bone, the neck of the Astra Tech dental implant stimulates surrounding bone with Micro-Thread retention elements – tiny threads that offer optimal load distribution and lower stress values. For more information, visit www.astratech.com.

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Strong (BioHorizons): BioHorizons was founded in 1994 as an incubator company at the University of Alabama at Birmingham (UAB). BioHorizons became involved in the development of implants through Biomechanical research conducted at UAB in conjunction with top clinicians. All of our implants have been developed as a result of years of scientific and clinical research.

Bonafede (Biomet 3i): Biomet 3i was founded in 1987 and we started initially by providing restorative components to the dental implant community. It just seemed a natural evolution for us to get involved with implants so that we could offer clinicians a total solution.

Niznick (Implant Direct): I have a 27-year history in the dental implant industry dating back to 1982 Core-Vent and 1997 Paragon Implant companies. Paragon was sold to what is now Zimmer Dental in 2001 and in 2005, I started Implant Direct in the factory I had been leasing to Zimmer and hired 80 of my former design engineers and machinists to develop a new system of application specific implants called Spectra-System. My new concept was to provide one implant body with six abutment options included in all-in-one packaging.

Harvey (IMTEC): Dr. Ronald A. Bulard, CEO of IMTEC, a 3M Company, realizing in the 1980s that the cost of implants was high, developed a plan that focused on cost effective quality implants for the international dental community. When IMTEC introduced small diameter MDIs in the late 1990s, this cost-effective business model combined with minimally invasive implantology struck a chord with the dental community.

Weisman/Wilford (MIS): In 1995 two dentists requested custom screws for the dental implant system they were currently using. This was the beginning of the thought process into the design and execution of manufacturing dental implants. We first manufactured for different brands, but since 1996 have been manufacturing only the MIS brand of implant systems.
Dalise (OCO Biomedical): OCO Biomedical began by developing and patenting the O-Ring Attachment systems primarily to attach sub periosteals to overdentures in the early 1970s. The O-Ring System was the first reproducible system, rather than a lab technician’s work of art that could not be reproduced for replacing worn dentures at a later time. Some companies actually licensed our patent so they could produce them. As it turned out, the O-Ring attachment system is still probably the most widely used attachment system for attaching overdentures worldwide, and the most user friendly and cost efficient for patient and dentist.

Ellison (Sterngold): Sterngold started out developing products for dental restoration – primarily alloys and attachments. This focus on attachments lead us to create implant abutments to help in the restoration of many types of implants. The first was the ERA Implant Abutment in 1990. The success of this abutment led us to purchase the ImplaMed implant company in 1993. With that move Sterngold became a manufacturer and seller of what are today called traditional implants. The company's expansion into this growing area of dentistry led to a number of new products. In 1999 the popularity of the ERA Attachment System was combined with a screw implant to fill a significant need in dentistry. The ERA Implant was designed to make it simpler and less expensive to restore an edentulous patient with an overdenture. The potential benefit to the public is the elimination of millions of ill-fitting and uncomfortable complete dentures.

Foster (Town & Country): Town & Country Dental Studios was one of the first Branemark implant laboratories in the United States. Over the last 40 years we remained on the forefront of implant technologies for the benefit of our doctors.

Zuest (Zest Anchors): Zest Anchors, Inc., manufactured the ZAAG Implant Attachment starting in 1994 to fit all dental implant systems available at that time.

What does your implant system offer to make restorations predictable?

Zuest (Zest Anchors): The Locator Implant Attachment is manufactured to fit all major brands of dental implants.
Foster (Town & Country): We developed our simplified implant restoration protocol (SIMPL) to help doctors restore more implants in less time and with less stress. Our patent-pending protocol does not require any implant parts from the doctor. Our one-fee pricing takes guesswork out of estimating cases. Our verification jigs and abutment placement jigs help avoid most of the problems with restoring implants, providing a better clinical result in a very predictable protocol.

Dalise (OCO Biomedical): It is simple, safe, and successful. We offer a direct technique, cutting down on surgical placement cost and time, and prosthetic restoration with costly lab bills. We also have an indirect technique and modified indirect which allows more involvement by the laboratory, but still allows the doctor to have some control and involvement once again reducing lab costs.

Weisman/Wilford (MIS): All of our implant systems have abutments borne from a prosthetic driven design. They are all manufactured in our own facility, which ensures consistency and we offer the best quality control that engineering can offer.

Strong (BioHorizons): A comprehensive line of prosthetics to fit the functional and aesthetic demands faced by today’s clinicians.

Harvey (IMTEC): Because the MDI system focuses on overdentures, IMTEC offers the Celara system. The Celara technique is used by labs and doctors to make dentures predictable and profitable. With the proven and patented Celara technique, clinicians can eliminate custom trays and wax rims and get more predictable try-ins than ever before.

Niznick (Implant Direct): Implant Direct offers the industry’s broadest selection of one- and two-piece implants with abutment included, simplifying ordering and saving significant costs. We also offer a full line of reasonably priced abutments compatible with Zimmer’s Screw-Vent (developed by Dr. Niznick), BioHorizons internal connection and Straumann’s internal Octagon (Both licensed under Dr. Niznick’s patent), and Nobel’s Tri-lobe connection.
Bonafede (Biomet 3i): All of our restorative components have a “click” feature. As you insert the restorative component into our Certain Implant, there’s a tactile feel and an audible click that indicate when the restorative component is fully seated. It makes it a little easier to determine when the components are engaged correctly. We also have a wide variety of restorative components available; some of which are in standard configurations, some of which are patient specific or customized.

Rodriguez (Astra Tech): The unique Astra Tech BioManagement Complex ensures surgical and restorative predictability through the combination of four interdependent features of OsseoSpeed (the only fluoride-modified implant surface on the market today), MicroThread (minute threads at the implant neck that ensures positive biomechanical bone stimulation for maintained marginal bone levels), Conical Seal Design (tight and precise implant-abutment internal connection) and Connective Contour (increased connective soft tissue contact zone). In particular, the Conical Seal Design transfers the load deeper into the bone and thereby reduces peak stresses for preserved marginal bone. The self-guiding design allows for quick and simple abutment installation that eliminates the need for a radiographic confirmation of seating. Our range of cement-, screw- and attachment-retained abutment solutions also provide clinicians with the products that predictably meet their clinical needs for all locations in the mouth.

How can implant placement become more predictable?

Harvey (IMTEC): IMTEC offers an adjustable torque wrench that quantifies initial stability during implant placement so doctors will understand at the time of placement if they’ve encountered enough resistance to load an implant. The use of CT technology can tell a doctor far more than 2D diagnostics about bone density, anatomical structures and bone quantity.

Ellison (Sterngold): Proper education, a reasonable amount of skill, and use of computer generated surgical guides involving CT scans.
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**Strong (BioHorizons):** Proper training of the clinician is essential. In addition, appropriate use of implant designs in the varying clinical and biomechanical conditions.

**Rodriguez (Astra Tech):** The key to increased implant placement predictability is the utilization of advanced imaging softwares that allow for the precise 3D visualization of the anatomy (including adjacent teeth, nerve locations, etc.) for accurate treatment planning. Surgical guides also allow for the planned treatment to be replicated in the actual surgical procedure. This is why Astra Tech offers Facilitate Computer Guided Implant Treatment.

**Weisman/Wilford (MIS):** Proper case selection will certainly help to improve the predictability of implant outcomes. Comprehensive treatment planning with all clinicians involved will also help to minimize less than optimal results.

**Zuest (Zest Anchors):** With improved coatings and designs.

**Dalise (OCO Biomedical):** With a total review of anatomy, total patient workup including panoramic and cone beam if necessary, study models, and the normal patient presurgical and prosthetic workup that any prudent doctor would do in a reconstructive case. This also includes reviewing the patient’s medical history.

**Bonafede (Biomet 3i):** Technology can always help. Biomet 3i is producing surfaces that we believe result in greater bone to implant contact in shorter time periods such as NanoTite and we are also involved in new technologies such as surgical guidance through instrumentation and third-

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*continued on page 74*
party software that allows a clinician to place an implant in exactly the same position as preplanned.

Niznick (Implant Direct): Image-guided surgery with treatment planning on CT radiographs will help solve the location issues in implant placement. Use of an evenly tapered implant inserted into a socket prepared with a straight drill of the appropriate diameter for either soft bone or dense bone will increase initial stability and eliminate the need for bone taps. Initial stability is the most critical issue to achieving osseointegration, especially if early or immediate load is being used.

In your opinion will the costs associated with implant placement and restoration decline in the next five years?

Dalise (OCO Biomedical): Yes. The trend seems to be going towards immediate loading, one-piece implants and direct restorative techniques, which ultimately reduces time and lab costs. I can easily foresee patients having a single tooth replacement offered to them for the same cost or slightly more than a conventional three-unit bridge without violating sound, natural teeth.

Weisman/Wilford (MIS): It is reasonable to expect prices to decline over the next five years. Competition will be at least one of the factors for this phenomenon.

Zuest (Zest Anchors): The costs to the patient will stay about the same but insurance will help to cover more of the expense.

Ellison (Sterngold): Many new implant placers, including general dentists, will drive the inflated cost down to a realistic level. But implant restoration might not decline. The dentist and lab costs associated with implant restoration are, in most cases, not over inflated.

Strong (BioHorizons): In my opinion, the costs will stay at current levels.
Is there a particular restorative application (fixed/removable) that your company is known for?

Weisman/Wilford (MIS): MIS offers a full complement of restorative options, both fixed and removable. Our most popular is the simplest. It is our CPS (complete prosthetic set) kit, which includes a straight abutment, implant analog, wax burnouts and a comfort cap. This kit is available at no charge to dentists who purchase multiple implants.

Dalise (OCO Biomedical): We started the O-Ball Attachment System, but our company has been known for innovation in the dental implant community since its onset. We were also the first company to come out with a reliable, predictable, one-piece root form implant (3.25mm, 4.0mm, and 5.0mm diameters), and a 3.0mm one-piece implant that performs just as well as its larger diameter implant “brothers.”

Zuest (Zest Anchors): Zest Anchors, Inc., is known for being the manufacturer of the Locator Implant Attachment for removable overdentures.

Ellison (Sterngold): Implant Supported Overdentures, both with the ERA Implant (for small diameter applications) and the ERA Implant Abutments for many traditional implants. These removable applications are the most popular within the Sterngold product line.

Bonafede (Biomet 3i): I think probably one of the hottest technologies we have right now is the Encode Restorative System. This is where a dentist can create a final restoration by only taking a supragingival impression of a very specialized healing abutment. There are no other manufacturers offering this in the industry.

Strong (BioHorizons): We offer prosthetics that satisfy both fixed and removable restorative methods.

Harvey (IMTEC): The efficiency of MDIs as a denture stabilization system has led to IMTEC being very closely associated with implant retained removable prosthetics.

Niznick (Implant Direct): I invented the concept of versatile prosthetic applications for implants in 1982 with the Core-Vent, an implant that accepted six different cemented abutments. With the introduction of the internal hex/thread and lead-in bevel connection, the modern era of implant prosthetics was started. Implant Direct has moved this concept to the next level by offering a variety of one-piece implants with different prosthetic abutment platforms, including the ScrewDirect with a straight head and a snap-on transfer capacity and the ScrewRedirect with an angled contoured head, both for cemented restorations; the ScrewIndirect with a screw-receiving head for detachable restorations, also with a snap-on transfer capability; and the GoDirect with a head that accepts Zest Locator attachments for overdenture retention.

Rodriguez (Astra Tech): In 2007, Astra Tech acquired Atlantis, the leading provider of patient-specific, cement-retained abutments in the U.S. Atlantis CAD/CAM abutments...
are provided through the utilization of a proprietary Atlantis VAD (Virtual Abutment Design) software that designs the optimal abutment based on the desired final tooth shape. Atlantis abutments simplify the overall restorative process as it requires the restorative dentist to only take an implant-level impression and send it on to their lab with a request for Atlantis. It also helps to ensure the highest level of predictability because it uses computer intelligence to guide the parameters of the abutment design.

Who should place implants?

Al-Faraje (California Implant Institute): General dentists should learn how to place their own implants because most often, when the specialists place the implants, the implants end up not where the restoring dentist wants them. Some oral surgeons and periodontists do not take the time to learn about implant prosthodontics and thus do not do a good job at the planning stage for the general dentists. The number, diameter and location of implants are usually specific to the type of prosthesis the patient will be ending up with.

Ellison (Steengold): Any dentist who learns how to place them properly. But, to place them properly requires a strong knowledge of restorative dentistry. The best candidates are prosthodontists and well-skilled and educated general dentists.

Bonafede (Biomet 3i): Biomet 3i believes in the traditional referral model. That means a patient comes to see his general practitioner and can be referred for surgery to a surgical specialist – who could be an oral surgeon or a periodontist, for example. We are not saying that a general dentist cannot place implants, but the necessary and proper amount of training is required.

Dalise (OCO Biomedical): Any dentist who feels that he/she has the skill, confidence and ability to place implants, and the desire to develop those skills.

What is an appropriate amount of time to obtain the necessary skills for implant placement?

Bonafede (Biomet 3i): I don’t think you can generally get the necessary amount of training in a weekend course. I think the types of educational programs that take more of a “continuum” approach where the general practitioner can, over the course of a year or longer, take eight to 10 comprehensive full-day courses to learn the surgical side is more appropriate.

Dalise (OCO Biomedical): Unfortunately, God has not distributed the gift of skill equally to all professionals. Each dentist should assess that particular subject themselves. We all have a knack to do certain things in dentistry that we both enjoy and love. For some, it would be best to avoid what we don’t do best.

Harvey (IMTEC): A general practitioner can learn to stabilize lower dentures with MDI Implants in a one- or two-day certification course. Successfully placing traditional implants
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requires substantially more training such as comprehensive implant courses, or MAXI courses, which span 10 months with classes held on weekends.

**Strong (BioHorizons):** It depends on the skill level of the clinician.

**Niznick (Implant Direct):** Surgical specialists coming right out of graduate programs certainly have a head start because implant placement is now a required part of their curriculum. GPs taking a concentrated Maxi-course from the AAID or other organizations can get up to speed on a variety of skills needed for successful implant placement in a concentrated period of time. An important aspect of shortening ones implant apprenticeship is to do a number of cases early on for little or no fee to gain experience and confidence in a broad range of applications.

**Why should/shouldn’t general dentists get involved in placing implants?**

**Bonafede (Biomet 3i):** If a general dentist is strongly motivated to place implants, then that’s fine. I would recommend that they get the appropriate training, which should be more than just a weekend course. If they get the appropriate training and want to use Biomet 3i implants, we’ll be more than happy to work with them.

**Zuest (Zest Anchors):** General dentists should start by restoring implant cases before surgically placing the implants themselves.

**Strong (BioHorizons):** The dental community is supporting general dentists training to place implants. Implant placement is now being taught in universities to students entering the field of general dentistry.

**Weisman/Wilford (MIS):** All dentists have an obligation to inform their patients of dental implants as a restorative option when appropriate. If properly trained, general dentists can successfully place implants, but if there is no interest on the part of the general dentist to become involved, that decision should be respected.

**Rodriguez (Astra Tech):** Whether or not a general dentist gets involved with the placement of implants should be dependent on their own goals and considerations for their practice and whether or not a surgical partner is readily available in the community that they service. However, a team approach is highly recommended and proven successful for all parties involved.

**Ellison (Sterngold):** Many general dentists will not want to get involved in placing implants. But, for those who have the skill and the desire to learn, placing implants can add to their profit while providing a necessary treatment to their patients at a more affordable cost. Also many patients will agree to implant treatment when they have the comfort of knowing that there regular dentist will perform the procedure as opposed to going to an unknown specialist.