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Dear Reader,

We’re happy to share our excitement about the significant momentum MIS Implants is gaining in the global marketplace. This is a result perhaps not of a single aspect of our business activities but of a combination of attributes that we foster through our mission and core values; forming the foundation for everything that happens at MIS. Our company mission is to ‘Make It Simple’ by simplifying dental implantology products and processes. However simplicity in implant dentistry doesn’t come easy. It requires an overreaching dedication to practical innovation, quality and service; many samples of which we’re proud to present in this issue of the MNEWS.

Some highlights include: Proven quality of MIS implants surface treatments as published in an independent research study; see Characterizations of MIS Implant Surface. An in-depth interview with renowned KOL, Prof. Federico Hernández Alfaro, leader in Oral and Maxillofacial Surgery in the private sector in Spain, new MIS products, advancements in manufacturing technology, strides in digital dentistry and outstanding MIS business partners from around the globe. MIS is equally proud of the investment we are making in education and training for our customers; doctors and clinicians using MIS products, as well as our employees and business partners worldwide. See the story about MIS training. We hope you enjoy the broad spectrum of articles contained in this issue. It’s fair to say that MIS is focused on the journey as well as the destination – to Make It Simple.

Happy reading!

Idan Kleifeld
CEO, MIS Implants Technologies Ltd.
AN EXCLUSIVE INTERVIEW WITH PROF. FEDERICO HERNÁNDEZ ALFARO

Prof. Hernández Alfaro is currently Director of the Teknon Medical Centre’s Maxillofacial Institute and Head of the Oral Surgery and Maxillofacial Department of the International University of Catalonia (UIC).

The Maxillofacial Institute of the Teknon Medical Centre is the leader in Oral and Maxillofacial Surgery in the private sector in Spain. The current facilities, opened in 1994, cover more than 60,000m², and are divided into several large and expertly equipped departments. This year the Teknon Medical Centre is celebrating its 20th Anniversary and is considered one of the leading medical centers in Europe today.
What distinguishes the Maxillofacial Institute?

The Maxillofacial Institute is the largest department at the Teknon Medical Centre, with a strong 18 member team. I think we’ve assembled the best human resources in the medical field and I believe our medical/surgical team is unparalleled anywhere.

We are equipped to treat large numbers of patients, specializing in difficult and complex cases. Because of our reputation for excellence, we draw a lot of patients from overseas – especially Eastern Europe and the Middle-East. We’re set up to provide our international patients with every necessary convenience for seamless treatment including accommodation, processing and documentation, and even translation services.

How does new research influence your work?

As Director for both the International University of Catalonia research facility and the Maxillofacial Institute at the Teknon Medical Centre, I’m in a unique position to advance a mutually beneficial relationship between both. The University and the Teknon are officially connected, which means research and treatment can work hand-in-hand. To my mind this creates a logical, practical, prestigious and productive partnership.

The largest percentage of patients at the Maxillofacial Institute require implant surgery, so it’s very important for us to have access to high quality, cutting-edge implant systems. We have therefore undertaken numerous projects in collaboration with MIS Implants.

What research are you conducting with MIS Implants?

We were the official testers for the MIS C1 implant system, a highly advanced conical connection implant developed in the past couple of years. A study done at the University on immediate loading of MIS implants was presented as a Thesis for one of our post graduate students, Dr. Torroella Saura, Gerard.

Dr. Susanna Garcia is involved in an exciting project with MIS; socket preservation testing with BONDBONE® – a breakthrough synthetic bone graft material manufactured by MIS. Research in socket preservation and bone resorption is still new, and this project is moving ahead nicely; with harvested samples having already been sent for CT evaluation. We are very pleased that our cooperation with MIS has led to the advancement of future doctors in the field.

In addition, we have collaborated with MIS on new and improved implant surfaces. This kind of research fits well with our department’s activities and the complex needs of our patients. We are very satisfied with the results and look forward to continuing our testing programs with MIS products.

Do you consider yourself an early adopter in implant technology?

I think of myself more as a first mover than an early adopter, but I suppose it’s a bit of both. Because we, meaning myself and my medical team, have such an in-depth experience with dental implants under many varied and difficult case conditions, we’ve acquired an almost innate ability to responsibly evaluate and select new products, materials and techniques that make sense. In the surgical arena for instance, our team have proposed many successful new protocols, with a reputation for successful and discrete use of new ideas; always keeping patient safety foremost in our minds. Being an early adopter or first mover in an academic environment is of course easier. The university setting itself is conducive to this kind of work; providing a ready-made infrastructure to conduct studies and test protocols.

I believe that early adopters do have an advantage in the implants industry. We make it our business to know what’s going on with innovations and new developments and understand the importance of establishing good collaborative relationships with companies doing cutting-edge R&D. Furthermore we are in a uniquely qualified position to conduct the necessary testing and analysis of new products, treatments and procedures.

What new or innovative protocols have you pioneered?

At the Maxillofacial Institute, we deal with the most challenging and complex cases. 20 years ago we had no choice but to begin to re-design and adapt existing standard protocols in order to answer the needs of our special patients; people with complex congenital mandibular or maxilla defects, extreme trauma cases, or cancer patients, cases with severe teeth and bone loss.

We were among the first to use short implants in trauma and cancer patients, at a time when everyone thought short implants were not sufficiently predictable or bio-mechanically stable. We have created original protocols for sinus lifts where there was little or no bone in the upper maxilla and are also involved in tissue engineering and regenerative research with stem cell technology.

From a scientific point of view, we run various lines of research in the sphere of bone regeneration with dental implants and, together with the team, have published around a hundred articles on orthognathic surgery, reconstructive maxillofacial surgery and complex dental implants cases. I have also authored various books distributed throughout the world: “Bone Grafting in Oral Implantology”, “Controversial issues in Implant Dentistry” both by Quintessence, and “Cirugía Avanzada en Implantes”.

How much do you rely on 3D diagnosis and planning?

In the field of diagnosis, the Maxillofacial Institute has been a pioneer in Europe in incorporating 3D diagnosis and planning in management of maxillofacial deformities. The addition of low-radiation 3D scanners and intraoral scanned surfaces means that each case can be analyzed and planned with extreme precision.

3D diagnosis and planning means that errors associated with the classic planning procedure, using plaster models mounted on an articulator, have been eliminated. This platform also allows 3D virtual surgery to be carried out during which the surgeon can make decisions and anticipate the best actions to apply to the upper jaw, lower jaw and other facial bone structures during surgery. This virtual planning avoids any surprises or unexpected incidents during surgery and considerably reduces the occurrence of errors in the position of the jaw. 3D technology helps us identify important features or flaws in the bone that we couldn’t otherwise see or accurately measure; parameters that can impact both drilling and the final prosthetic outcome.

On average the Barcelona Maxillofacial Institute carries out 150 orthognathic surgery cases each year, and all are planned in this 3D virtual environment.

What is your current focus?

We deal with the Oral Maxillofacial handicapped, sometimes pioneering difficult surgical techniques to remedy facial deformities via innovative treatments and
protocols. We are involved in active research, management and treatment or Mandibular and Maxillary tumors, trauma and atrophy using bone grafts and biomaterials and various shapes and sizes of implants. It is also important to us to keep the patient in mind, making every effort to provide efficient, cost effective treatments for successful long-term outcomes.

We are very proud of the class-A, cutting edge research our department is engaged in at the International University of Catalonia, which is really far in advance of what's being done at many other major universities and research facilities elsewhere; innovative dentistry and biological research.

Another characteristic of our work is an adaptive approach regarding implantology. We strive to find a common ground with dentists and clinicians in an effort to answer their most pressing practical needs based on new and improved products and protocols.

What is your focus for the future?

Implant dentistry has changed a lot in the past 30 years and it’s changing still. We're proud to be a part of that evolution; however we haven’t lost sight of the focus that matters most – what matters to our patients. Patients want their teeth back quickly, and to return to a normal life. They also want to spend less time and money on the process, which is understandable.

We are continuously looking to improve treatments. The future means being able to offer our patients more efficiently designed implants with quicker healing properties, to streamline protocols for less complex or invasive surgical procedures and to provide the latest regenerative solutions; such as endogenous bone grafting.

Our interest in new implant technology brings us to inquiry about new surface treatments and bio-surfacing; research we are currently conducting in cooperation with MIS. We are also working towards comprehensive testing of a wide range of implant sizes. Once '10mm implants were considered 'short'. Now 6mm down to 4mm are short. We need to determine the long-term predictability of short implant sizes within diverse case scenarios.

We are also investigating reconstructive therapy using new biomaterials with implants – the simultaneous placement of implants with biomaterials. Looking even further into the future, we hope to someday produce new teeth, without introducing foreign materials into the body. And perhaps, further still, science will give us the ability to replace all the organs in the human body.

Prof. Federico Hernández Alfaro leads the medical team at the Maxillofacial Institute of Barcelona. He is a Bachelor of Medicine, Surgery and Dentistry and is a specialist in Oral and Maxillofacial Surgery in Barcelona, and Doctor “Cum Laude” at the International University of Catalonia.

Prof. Alfaro completed his training in the United States, Switzerland, Mexico and Italy, and is a Fellow of the “European Board of Maxillofacial Surgery”. He is also Spain’s most experienced surgeon in treating maxillofacial deformities (orthognathic surgery) and, together with his team, has developed and published many oral and maxillofacial surgical techniques. Prof. Alfaro is a regular speaker at international congresses on orthognathic and reconstructive surgery.
Maxillofacial Institute of the Teknon Medical Centre, leaders in Spain in Oral and Maxillofacial Surgery in the private sector.
INNOVATION PERMEATES OUR ENTIRE ORGANIZATION, AND WE EMBRACE A PROACTIVE PROCESS WHEREBY RESOURCES ARE ALLOCATED TO IDENTIFY MARKET CHANGES AND NEW PRODUCT NEEDS. AS INDUSTRY LEADERS, WE APPROACH NEW PRODUCT DEVELOPMENT IN BOTH BIG AND SMALL WAYS, LEADING TO A CONTINUOUS STREAM OF PRODUCT IMPROVEMENTS.
The MIS Torque Wrench is a precision instrument engineered to achieve controlled torque when tightening abutments, cover screws, healing caps etc. The torque indicator range is between 10-30 Ncm and is manufactured for an accuracy of ±2 Ncm. The Torque Wrench prevents over-tightening of the screw, which may cause damage to the thread or hex connection. The innovative Torque Wrench is a superior torque measurement tool which transforms the one-piece MIS Ratchet Wrench into a highly efficient torque wrench tool.

Ratchet Wrench

The new MIS ratchet wrench, one of the simplest on the market, is designed as a universal tool for placing and adjusting dental implant abutments and screws for a wide range of sizes. This lightweight, durable ratchet wrench features a sleek mono-block design, with no lever, complex contours or mechanical components that would require disassembly and re-assembly. Elad Ginat, Products Manager at MIS Implants explains, “It’s a real time-saving tool, with a streamlined shape that prevents the accumulation of contaminants like blood or saliva. This ratchet wrench is ideal for easy cleaning for a safer procedure.” The new ratchet wrench replaces a previous version and was developed to be an even simpler and more efficient tool than the earlier model. It effectively reduces the number of tools in the portfolio, operating as an insertion tool for various MIS implant models, as a direct key mechanism or as a screw driver. The ratchet, along with an assortment of newly designed tools, now comes as standard in many updated MIS surgical kits. This includes a special time-saving insertion key that allows for both manual operation and use with the ratchet - making it easier for doctors to determine whether torque is being applied or released; both visually or by touch. The ratchet may also be obtained separately, supplied with a designated adaptor to support other MIS surgical kits and previous versions of the updated kits. “All of these great design features create a really good user experience for the doctor - and it’s a tool they love to use”, continues Elad. “To ensure accuracy, efficiency and simplicity, MIS continues to develop innovative tools and prosthetic solutions to assist clinicians every step of the way.”

Torque Wrench
Anatomically Shaped Multi-Unit Abutments

Used for screw retained, fixed restorations, the new Multi-Unit abutments feature a rounded anatomical shape, wider restorative platform and full rounded screw holes. The low profile and conical shape support even the most demanding clinical situations. A new line of prosthetic products has been specifically designed to fit the new Multi-Unit system. Multi-Unit abutments come in both straight and angulated configurations. Straight abutments can be used with implants with a divergence of up to 40º. 17º angulated Multi-Units can be used with implants with divergence of up to 75º and 30º angulated Multi-Units can be used with implants with divergence of up to 100º.

Position Drill

The new Position Drill by MIS is specifically designed to allow visualization of the final positioning of the implant at the beginning of the drilling procedure. A distinct improvement over traditional round or spade marking drills, the Position Drill ensures a more precise implant placement on any given ridge. The short, sharp drilling head secures the drill at the required position on the bone. A 4mm ring seated above the drill head, allows visualization of the final implant diameter and accurate positioning at the end of the drilling procedure. The ring diameter allows a good estimation for positioning all MIS implants of diameters from 3.30 up to 5mm.
MIS AUSTRALIA

COMING UP ON TOP, DOWN UNDER
As a global leader in the dental implants industry, MIS has built a strong business presence worldwide. Australia ranks as a leading economy in the Asia Pacific region, with a relatively high growth and low-inflation economy supported by solid political and economic institutions and an internationally competitive business sector.

MIS is fortunate to have Mr. Jacob (Kobi) Gilmore, a dedicated champion maximizing our sales potential in Australia along with maintaining our reputation for excellence and strengthening our presence in the region. Kobi, with degrees in pharmacy, science and marketing, is also head of the DIA training facility in Melbourne. In his own words, Kobi gives us an insight into the MIS Australia operation.

How It All Started

Our company name, Moredent, based in Melbourne, began in 2006. Ori David, Regional Sales and Marketing Manager of MIS Asia Pacific, started around the same time and we’ve been in a close working relationship ever since. Today we have about 25 members on our team.

I strongly believe that success hinges on a great team. When you’ve got the right team, you can do anything! Many of our team members were sports champions in their own right, and that’s no accident in my mind. There’s definitely a connection that hinges on being highly motivated, committed and competitive as a sales force.

When we first started we were a business in the medical instruments field but recognized the wave of the future - dental implants. Choosing the right company to work with was an important focus. When we met with Doron Peretz, VP of Marketing and Development of MIS Implants, we were impressed. Here was someone who knew the implants market from the ground up was dedicated to providing a seriously high quality product and had amazing customer rapport.

However in my mind what really set MIS apart was their vision and innovative outlook – which really matched my own style of doing business. In the beginning, we recognized that Australia wasn’t a huge market, with a population of only about 23 million and low implant penetration rate. However it’s an important market for dental implants - a population with a high level of education and a strong stable economy albeit we have had some economic weakness in recent times.

Facing the Challenges

We had a challenge on our hands; to reach out to Australian dentists and clinicians, who were considered quite conservative in their market behavior, and to get the MIS brand positioned in the face of some stiff competition from better established brands in the region at that time. How did we plan to move forward?

We decided not only to stick with the MIS motto to ‘Make it Simple’; we realized we also needed to concentrate our marketing efforts to ‘Make it Smart’!

That meant really doing our homework in order to understand our customers – to get behind them not only by recognizing their needs, but anticipating and exceeding their needs, offering simple, concrete solutions to real problems in a timely and cost effective way. MIS Implants Australia went from the status of newcomer to being the third largest implant brand sold in the country today.

But before you can pitch your products and services to potential customers, you’ve got to get their attention first – in other words, be noticed. And that’s a lot of where our innovative marketing approach came in. We managed to do this on two fronts: Promotion and education.

Innovative Promotions

Aside from the usual type of promotional and advertising initiatives most companies put into action, we went much further to reach our audience with the MIS marketing message. Truly amazing promotional events have become our specialty, and the most popular by far are our ongoing MIS Drive Days.

Our first Drive Day was launched in 2007 with Porsche. We have since held this event every year with growing popularity – so popular in fact that clinicians are queuing up to attend. The rationale of the Drive Day concept is to pair MIS with a great quality automobile brand such as Porsche or Mercedes Benz; brands that reflect some of the same intrinsic values as MIS implants: high quality, great customer care and a unique eye for technology and innovation.

Then comes the fun part – we go out on the road with these iconic cars for an amazing cruise on tracks outside Australia’s cities.
very important in opening up dialogue between clinicians who are sincerely interested in what other dental professionals are thinking about and doing in their practices. Of course Golf Days as well as Drive Days give MIS the opportunity to offer new information and solutions to many practical implant issues of interest to doctors everywhere.

MIS Australia is also the home of the MIS Golf Day. These sorts of promotional events are very important in opening up dialogue between clinicians who are sincerely interested in what other dental professionals are thinking about and doing in their practices. Of course Golf Days as well as Drive Days give MIS the opportunity to offer new information and solutions to many practical implant issues of interest to doctors everywhere.

Courses are given by an expert team of highly respected lecturers on the topics of live implant surgery, basic and advanced implantology and surgical techniques, implant restoration procedures, implant retained overdenture, bone grafting & socket preservation, advanced bone grafting procedures for implants, sinus lift procedures, optimal surgical and restorative techniques with dental implants, enhancing success with implant dentistry in your practice, infection control and more.

Today, DIA is not only recognized by the Dental Board of Australia, but recommended by them. In fact dentists are not able to practice implant dentistry without completing the DIA course curriculum.

Goals for the Future

What are our goals for the future? As I mentioned before, MIS Implants Australia is now the number three implant brand sold in the country, however we see the number one spot as well within our reach in the near future. We’re very aware that some of the ‘established’ implant brands are now copying much of what we do, and that gives us the clearest indication that we’re not only on the right track, but are the established innovators in the field.

MIS Implants are dedicated to bringing to the global dental industry a steady stream of cutting-edge, high quality, simple-to-use, and cost-effective new products in order to meet the evolving needs of our worldwide client base, and to establish and maintain our reputation as a recognized leader in the field.

Through the quality and design of our products, we strive to ensure that every dental professional performing implant surgery with our products will enjoy the highest level of convenience and comfort, as well as a sense of complete confidence. We are equally
dedicated to the creation of permanent smiles among the patients for whom our products are designed.

To assure the achievement of these goals, MIS invests a significant portion of its profits in ongoing R&D, and in the acquisition of the most advanced manufacturing equipment and quality assurance systems available on the market.

What We Can Offer Our Customers

We are currently geared up for the future with many initiatives to bring our message to an ever growing market – with the launch of our new website and mobile applications. We hope to lead the way with industry-based social media initiatives including blogs, peer-review groups – every way in which we can offer quality networking experiences to our customers.

That’s really the most important final point here – what we can offer our customers. It’s vitally important to MIS, part of our company philosophy in fact, to learn from our customers – dental professionals throughout the region. We have a long and fruitful history working hand in hand with MIS Asia Pacific to provide clinicians with real solutions to the real problems they face in their practices daily and to ‘simplify’ the issues.
MIS TO ASSIST DENTISTS IN MASTERING IMPLANTOLOGY SKILLS

PATIENT INTEREST IN DENTAL IMPLANTS IS ON THE RISE THE WORLD OVER THEREFORE DENTISTS SHOULD BE COMPETENT TO OFFER THIS TREATMENT AS PART OF A COMPREHENSIVE CARE PACKAGE TO THEIR PATIENTS.
To fill the gap between theory and practice, or further develop the clinician's skills, the MIS training division has developed an international implantology course series; from fundamental to advanced, that allows general dentists, periodontists, prosthodontists and oral surgeons to gain proficiency in implant dentistry in the company of their peers from around the world.

The course curriculum is designed for small class sizes, to guarantee individualized attention, and includes lectures by top international authorities in implant dentistry, clinical case studies, live surgery demonstrations and hands-on workshops. Participants also receive a unique insight into cutting-edge implant dentistry through special lectures at a recognized academic institution of dental medicine. All course material is presented in English.

The upcoming Fundamental Implantology Course for Doctors is scheduled for February 2015 and will showcase the following key topics: Anatomical Considerations and CT Evaluation, Patient and Case Evaluation, Protocols on Placement of Implants and Hands-on Model Activities, Soft Tissue Management Around Implants, Treatment Planning: Single Implants and Immediate Placement, Impression Taking and Prosthetic Options in Implant Dentistry, Surgical Complications, Peri-Implantitis, Clinical Cases Overview and a Planned Live Surgery Observation.

In addition to doctors' courses, MIS also runs practical internal training programs on multiple levels for employees, sales personnel and MIS subsidiaries’ staff.

“Training isn’t simply about attending a course”, says Dr. Shelly Akazany. “At MIS it’s a dynamic ongoing enrichment process; an organizational and individual activity that occurs in the workplace both formally and informally on a daily basis.”

MIS is committed to having a strong and successful internal training strategy in order to create a company-wide culture of learning. Training programs offer practical knowledge about MIS implants innovations, products, materials and procedures, plus soft skills; such as sales approaches, market agility and better business practices.

The vision at MIS is to simplify training platforms to support business goals; in order to develop and maintain a high performance workforce. Along with traditional classroom-style lectures and presentations, MIS supplies critical reinforcement to complete the picture, such as pre-training orientation, job-aid quick reference guides, procedural and video instruction, and a worker-supported environment that encourages mentoring plus personal inquiry and enrichment.

The MTC (MIS Training Center) was founded on the belief that integrating implantology skills into dental practices is a must, and that an investment in implant training ensures continued long-term rewards for both doctors and their patients.
Dr. Shelly Akazany,
MIS Implants Technologies Ltd.
Training Manager
OUR MISSION:

TO simplify dental implantology

MIS®
MIS implants adopt a unique global strategy for global success that's speaking to dental implant professionals the world over. It's simply what doctors want - quality and simplicity.

For almost 20 years, MIS implant products and procedures have consistently set the standard for quality, service, innovation, availability, and most of all, simplicity.

“In the dental profession especially, time means money. The ease-of-use factor built-in to all MIS implant systems, surgical instruments, kits and accessories are saving clinicians valuable preparation and chair-time during surgical procedures”, explains Mr. Idan Kleifeld, MIS CEO.

“However, simple doesn’t always come easy”, continues Idan. “It requires a very high level of practical expertise and design sense to engineer implant systems and tools that allow doctors to perform the kind of fluid and logical surgical sequences that make procedures faster while actually enhancing accuracy.”

All MIS components and tools fit each other with extreme precision, providing optimal implant stability and BIC (bone-to-implant contact), a superior implant to abutment connection that reduces micro-movements, as well as a wide selection of abutment options designed for maneuverability and excellent esthetic results.

The MIS principles governing R&D, manufacturing and customer support don’t end with just making it simple. The company has forged a deep commitment to a vision, mission and non-negotiable values that are at the heart of the MIS strategic business plan.

Vision, mission and value statements are critically important because those who share the same core values, including employees, business partners, vendors and customers, are more likely to succeed.

As a leader in the dental implants industry, MIS Implants Technologies Ltd. makes it a priority to implement its vision, mission and values in every phase of its operations on a daily basis.
Dr. Samet’s presentation aims to discuss different drilling protocols, and to suggest logical alterations to ensure high primary stability of dental implants in common clinical scenarios. "It is vital that drilling protocols are able to address other common implant
It is vital that drilling protocols are able to address other common implant placement scenarios beyond the classic full bone scenario.

Drilling protocols have changed little in the past few decades, mainly because dental implants were traditionally only placed into fully healed bone. However with more recent advancements in dental implantology, it is now a recognized fact that implants can be placed in many different clinical scenarios; partially healed bone (delayed placement) as well as into fresh sockets (immediate placement).

Therefore, it is vital that drilling protocols are able to address other common implant placement scenarios beyond the classic full bone scenario, including conditions such as posterior sockets or partial missing bone and anterior sockets. Since in all clinical conditions, the initial stability of the implant is the primary consideration, it is therefore critical to ensure that the drilling protocol supports the required end result; and not be portrayed as a single standard procedure.

Questioning the efficacy of current protocols necessitates reexamining the fundamental concepts behind them. The main objective of drilling is to create space in bone to ensure the stability of the placed implant. Stability can be achieved in different ways, depending on the condition of bone; utilizing either the full length of the implant or engaging just part of it.

For full bone conditions current drilling protocols make sense, and fulfill the desired objective. On the other hand, in sockets or where some of the bone is missing, initial stability is gained by utilizing the apical portion of the implant. In these cases, conventional drilling protocols may not achieve the desired objectives.

Revisiting drilling protocols also requires a better understanding of the difference between available drills. Unlike drilling procedures in regular dentistry, where sideways drilling is the norm, dental implantology drills are designed to cut downwards only and not sideways. Using implant drills to cut sideways may result in broken drills or widening of the apical portion of the osteotomy, which may compromise initial stability.

As part of our continued investment in technology as a precondition for growth and innovation, MIS Implants will be introducing a concept by which drilling should be divided into three basic clinical scenarios, and will propose guidelines for each. In addition, a new marking drill and data from the latest studies will suggest further changes in drilling protocols.

“...It is vital that drilling protocols are able to address other common implant placement scenarios beyond the classic full bone scenario..."
MIS IMPLANTS: PROVEN SURFACE QUALITY

CHARACTERIZATIONS OF MIS IMPLANT SURFACE

Dr. Tal Reiner, MIS Materials Discipline Manager

Introduction

Long-term clinical success of dental implants is dependent on a number of critical factors including implant design, bone quality and quantity, surgical techniques and clinician’s skills. However above and beyond implant materials and geometry, the topography and chemistry of the implant; surface treatment and surface quality, is just as important in achieving high success rates.

Improving Osseointegration

Osseointegration is defined as the attachment of the bone to a dental implant, and is the critical factor related to the long-term success of dental implants. Implant surface treatments are employed to improve the capacity of anchorage into bone. This can be observed in an early healing phase in comparison with a simple turned implant surface.

Numerous studies suggest a predictable and more rapid osseointegration of implants using surface treatments in a combination of sand-blasting and acid-etching. Osteoblast proliferation and differentiation depends on the micro and nanostructures on the surface of the implant that closely mimic the natural bone matrix. MIS implant surfaces most closely mimics the natural cancellous (spongy) bone configuration and shows an enhanced surface purity when tested against other major implant brands using SEM technology.

Managing Contaminants

The chemical composition of the implant surfaces can vary due to manufacturing finishing’s such as titanium machining, thermal treatment, cleaning and sterilization procedures. Surface contaminants, such as trace metals, ions, lubricants and detergents left over from machining and cleaning processes require the careful control of implant surfaces as a procedure in itself, to ensure the quality of the implant.
MIS implants undergo routine stringent surface characterization and validation procedures using SEM (Scanning Electron Microscopy) and XPS (X-ray Photoelectron Spectroscopy) that verify low carbon percentage on the surface of the implant and low level of other contaminants.

**Raw Materials**

Titanium and its alloys are amongst the most commonly used implant materials in dental implant production, as it features highly desirable biocompatibility. MIS implants are comprised of Titanium alloy Ti-6Al-4V-ELI (Grade 23) ELI=Extra Low Interstitials (contaminations). This grade is a higher purity version of Ti-6Al-4V (Grade 5), conforming to the ASTM F136-08E1 Standard Alloy for Surgical Implant Applications. It is particularly corrosion resistant with very high tensile strength and fracture resistance properties.

**Characterization of the MIS Implant Surface**

The surface of a dental implant determines the initial phase of biological response to the inserted implant. The scanning electron microscope (SEM) is a very powerful tool for surface characterization. It uses a high-intensity voltage electron beam which scans the implant surface. The electrons interact with atoms in the sample, producing various detectable signals containing information about the sample surface topography and composition.

Images and spectra are generated utilizing 3 types of detectors:

1. SE detector; generating high resolution images of the surface at high magnifications, up to X10,000.

2. BSE detector; generating images including contamination detection. Contamination appears as a black dot on the white Titanium background.

3. EDS detector; enables obtaining the chemical composition spectrum of any chosen area or point, to the depth of 1-2 micro-meters.

X-ray Photoelectron Spectroscopy (XPS) is a surface chemical analysis technique that can be used to analyze the surface chemistry of a material. It measures the elemental composition at the parts per-thousand range, from the upper 10 nm of the surface. Upper oxide thickness can also be calculated.

MIS implants taken from the production line, are characterized on a daily basis by SEM microscope and every quarter annually, by XPS analysis as a routine quality inspection procedure.
**Protocol**

A conclusive summary of quality inspections by MIS Implants as performed via SEM microscopy analysis and XPS analysis, and an illustration of recent inspection results.

**Methods:** Implants are inspected following surface treatment and packaging in a sleeve within an inner tube. Never touching the surface, implants are removed from the package by forceps inserted into the inner screw thread. Implants are fixed onto a sample holder above a layer of a carbon conductive double-sided adhesive tape.

An in-house SEM: Tescan electron microscope with a Bruker EDS detector is used for the characterization of the surface. Internal software analyzes the percentage of impurities per-surface area using contrast analysis on BSE images.

XPS analysis is done at a near-by university by Dr. Kamira Weinfeld, employing a VG Scientific Sigma Probe instrument.

**Results:** SE and BSE images of various MIS implant surfaces from recent production lots. Possible contaminants on implants are blasting media residues or organic dot impurities. Contamination incidence in daily inspections does not exceed 0.2% of the surface area.

Recent XPS analysis of an MIS SEVEN® implant production lot is shown in table 1, where a low carbon percentage on the surface is shown.

The lower the carbon percentage, indicates the increased hydrophilic properties of the surface. A hydrophilic surface attracts blood to initiate the process of osseointegration. Current literature demonstrates a link between improved bone healing and early osseointegration with hydrophilic properties.

Using an XPS instrument, the upper Titanium oxide layer thickness was also calculated. Aluminum and Vanadium in the table originate from the raw material substrate under the Titanium-oxide.

**Conclusions:** Using surface characterization technology, MIS can guarantee that our implant surfaces uphold the highest standards of surface quality with a 99.8-100% pure Titanium-oxide surface, as well as the validation of full coverage by sand-blasting and acid-etching. These surface treatments help eliminate various surface contaminants while increasing the implant surface area; generating a hydrophilic surface with micro and nanostructures for optimum osseointegration.
“No pollution or chemical modification was detected on the MIS SEVEN implant, titanium grade 5 ELI, grade 23.”

From an independent research article published in The POSEIDO Journal 2014 (Volume 2): “Identification card and codification of the chemical and morphological characteristics of 62 dental implant surfaces”.

ANATOMY OF THE MIS MCENTER

More than ever, doctors are taking advantage of virtual implant planning and guided surgery in their everyday practices, to achieve the highest level of accuracy for increased success rates. MIS MCENTER facilities have their finger on the pulse of digital dentistry, assisting doctors around the world to significantly advance the efficacy of their practices and the quality of treatment they can offer their patients.

But What Actually is an MCENTER?

Think of it as a human body, where all systems work together to perform an entire matrix of activities such as case design, technical support, equipment upkeep, training and education, R&D and more.

The Eyes – Case Design

The basis for assisting doctors in planning cases is that the MCENTER has the technology to help clinicians to see more. DICOM data from the CBCT scan of the patient’s jaw along with surface scans of stone model and wax-up are uploaded to the MSOFT software program, generating multi-level, 2D planning views and 3D composite representations of the patient’s anatomy, in order to create the perfect placement and surgical plan. This same high precision technology is used to print the open-frame drilling template that allows quicker, more accurate implant placement for the benefit of the dentist and patient alike.

Top-down planning: Using the MSOFT, the clinician is able to see through bone to detect structures or flaws that can impact drilling and implant placement. Implants may be more accurately placed according to depth, position and angulation in relation to the desired prosthetic solution. The software enables the clinician to determine the most suitable abutment type according to gingival and prosthetic heights, as well as angulation of the abutment.

The Ears – Technical Support

MCENTER technicians know how to listen and are in constant contact with other MCENTERs and implantology professionals around the world via Skype or email, to discuss issues such as protocols, software, case consults and more.

The MCENTER is in tune with the needs of doctors and clinicians by providing better case documentation. The MSOFT technology allows all aspects of the virtual planning process to be well documented and stored on the Cloud for future reference. When a surgeon or dentist can refer to measurable values rather than subjective judgments alone as the basis for decision-making, it is easier to explain treatment choices to patients. Reliable case documentation also enables more accurate appraisal of outcomes and case assessments for future procedures.

The entire MGUIDE guided surgery process, MIS implant systems, tools and surgical kits come with in-depth guidelines and protocols geared to make it simple and safe. User manuals are organized in an easy step-by-step format and include information about contraindications that may impact the success of the surgical procedure and the patient’s overall health or safety.

The Muscle – Work Process

MCENTER protocol begins by processing the dentist’s written work order which includes a stone model, wax-up and additional case information such as implant positions, sinus lifts, edentulous or tooth supported and overall case assessment by the dentist.

The MCENTER then creates a 3D image for a preliminary implant placement plan.
according to strict procedures: Scanning the model and upload data into the software, locating important features such as the Mandibular nerve, determining the MIS SEVEN implant diameter and length to be used, the position relative to the prosthetic outcome and its position relative to the bone. After this stage the clinician is required to review and approve the preliminary implant placement plan.

The open wire-frame template itself is designed on the scanned image of the stone model in the software and will require further review and approval by the clinician. When this is complete, the actual 3D printing of the template is done. The advanced open wire-frame template design allows for an open field of view during surgical procedures, accessibility for irrigation and easy delivery of anesthesia. All necessary quality checks of the template are performed by the MCENTER after which the template is packaged and sent by courier or express mail to the dentist.

The MLAB is designed to offer advanced CAD/CAM capabilities to serve all our customers. The MLAB can provide immediate temporary custom healing caps, abutments and screw retained crowns and bridges from PMMA. Additionally, permanent custom abutments and copings are available in Zirconia and Ceramill Sintron®. Using MIS products throughout the entire process ensures 100% component compatibility for optimum accuracy, reliability and fit.

THE HANDS – State-Of-The-Art Equipment

Like the hands of a highly skilled artisan, the entire MCENTER process involving the MSOFT, MGUIDE and MLAB, is shaped by precision state-of-the-art equipment, to help create the perfect plan and flawless template.

One of the important daily tasks of the MCENTER team is to ensure the seamless operation of all machines, computers and other equipment necessary to scan the models, generate the 3D virtual implant plan and manufacture the templates:

Scanners that construct 3D images of the models are supplied by Amann Girrbach AG. Offering top accuracy, the scanners are maintained at the MCENTER via routine calibration, hardware upgrades and quality testing.

MCENTER technicians are specialists concerning every sphere of the MSOFT planning software. Precision 2D and 3D imaging of the patient’s anatomy for both case planning and template production demands a cutting-edge approach to software upgrades and quality checks.

Extremely accurate, user friendly 3D Printers provided by Stratasys; the world’s most experienced name in 3D printing equipment, produce the surgical template.

THE HEART – Assistance & Cooperation

Collaboration and caring is at the heart of any successful operation. MCENTERS around the world share technical know-how and offer mutual technical assistance to achieve the best results. Continuing efforts to identify critical knowledge, encourage innovation and enhance proficiency are at the core of this technical global network that doctors can rely on.

The MCENTER also works hard on administrative optimization, to streamline operations and allow even further cooperation and knowledge-sharing between MCENTERS in different locations. The aim is to establish more MCENTER facilities around the world where dentists can work in their own time zone and speak their local language.

Because MCENTERS operate in many locations globally, they can provide quick turnaround on
delivery of templates without customs handling delays or added costs. Surgery and restorative treatment can move forward more quickly and efficiently, saving both doctors and their patients time and money – benefits that are close to everyone’s heart.

THE BRAIN - Training & Education

The MCENTER uses its brain to assist system users in increasing their brain power through training and education. Doctors have access to complete guidelines and instructions in the proper use and care of the MGUIDE surgical kits, tools and instruments that have been specially engineered to optimize the guided implant surgery procedure.

In addition, satellite courses held at MIS educational facilities in a number of key locations worldwide, offer doctors and clinicians the opportunity to attend lectures, hands-on workshops and clinical cases that demonstrate the MSOFT virtual planning technology and guided surgical procedure live. But you don’t have to be sitting in a classroom to gain a wide spectrum of information about the MGUIDE system. Through our online webinars, participants experience intensive one-on-one training, presented by an MCENTER expert. Webinars cover every phase of the system in an easy to follow step-by-step process. Webinar sessions are broken down into logical topics for focused training.

THE FEET - Research & Development

Always running ahead to meet current challenges and anticipate future needs, the MCENTER staff keep up-to-date with technological advancements in the field of digital dentistry. MIS researchers and engineers understand where the market is heading; seeking out emerging technologies and developing new proprietary tools in order to enhance all phases of MCENTER activities.

MIS Implants Technologies Ltd., drive the MGUIDE R&D efforts by conducting scientific research in collaboration with respected universities and research institutes worldwide, with the aim of pioneering and validating improved methods and techniques in implant dentistry; making it simple, safe and effective. Further research and development activities include taking part in clinical studies, clinical trials, publishing in trade journals, peer reviews and more.

The MGUIDE system is currently available for use with the MIS SEVEN implant; the world’s best-selling dental implant, that comes in varying lengths and platform sizes. Stepping up development however, MIS is engaged in designing new tools to incorporate additional MIS implant models into the MGUIDE system.

In Conclusion

The clinician’s professional judgment and MCENTER technician’s expertise are vital components to the success of any guided planning procedure. Doctors can rest assured that there are no weak links in the MCENTER chain. All vital functions in the MCENTER body – MSOFT, MGUIDE and MLAB, are in top form and synchronized to deliver accurate implant planning schematics and optimized guided surgery templates, for a quicker safer and more accurate surgical procedure.

“In short, the MCENTER can ‘Make it Simple’ for an accurate, easy and safe surgical procedure with consistently better outcomes, now and in the future.”
Upload of the DICOM data for 3D evaluations.
A COMPANYWIDE CULTURE OF ENVIRONMENTAL AWARENESS IS ENCOURAGED AT MIS

GREENER DENTAL IMPLANT MANUFACTURING
All innovation begins with a state of mind; an attitude that allows great new concepts to take root and grow. It's that revolutionary and evolutionary outlook that has led MIS Implants to become one of the world’s top leaders in the development and manufacture of dental implants. But innovation isn’t just about products; it’s also a way of looking at the world that says “we want to make things better”. Quality, integrity and caring are qualities built-in to the MIS brand and that includes behaving responsibly when it comes to how our products are manufactured. Environmental responsibility is enough of a priority at MIS to have warranted the establishment of a dedicated in-house Safety and Environmental Department, dealing exclusively with these issues.

A company-wide culture of environmental awareness is encouraged at MIS, with new employees attending environmental/safety orientation. Engineering, production, quality assurance, chemical treatment, packaging, marketing and more – all departments must share in conserving energy and the responsible handling of waste, according to official procedures set out for each stage of MIS operations.

THE PRODUCTION FLOOR: Greening a highly advanced metal machining and treatment facility is as complex as the varied manufacturing processes themselves. It’s a large task that requires a deep understanding of both cutting-edge implant production and the latest in recycling and repurposing technologies. MIS engages the services of a number of certified processing facilities, each specializing in a specific phase of environmentally friendly handing, cleaning, repurposing, recycling, dismantling or disposal of many different forms of waste; from the benign to the hazardous.

MANAGING RESOURCES: Most people flinch when paying their own home utility bills and probably couldn’t even imagine the cost of running a manufacturing plant. For the manufacturer utilities such as water, electricity and gas, in terms of money and natural resources, is costly. From laboratories to conference rooms and everywhere in between, proper management of these resources is an environmental “must” at MIS.

Lighting requirements vary greatly in a large complex. An effective and efficient lighting plan is essential in providing a practical, pleasant and healthy working environment while lowering energy consumption. MIS uses energy saving bulbs in natural-sunlight shades where possible, sensor activated lighting in public spaces such as restrooms or car parks, and a meticulous building-wide maintenance program to ensure optimum efficiency.

FORWARD THINKING: Looking deeper within our own skills base, MIS is finding ways of providing solutions that help minimize our overall impact on the environment. When it comes to paper in the workplace, reducing waste always trumps recycling and MIS strives to ‘do it digitally’ whenever possible. Our in-house design studio has developed proprietary mobile applications, such as the MIS “TABCASE”, for presenting promotional materials and tutorials via tablets and smart phones. Even our printed adverts help save paper; with an embedded QR code that when scanned by a mobile device, allows the viewer access to additional product information such as guidelines or videos.

FROM THE TOP: MIS management is keeping a positive mindset to change; being both agile and vigilant in the quest to run an environmentally friendlier manufacturing plant. Sustainability messages are delivered from the top via the Safety and Environmental Officer, reminding all employees of the correct environmental procedures within the company and of their own personal responsibility to uphold a greener way of working.
MIS implants Technologies Ltd. is building a fantastic following of dental professionals around the world, serious about social media. We’re not only creating awareness about MIS products and services, we’re getting to know people – lots of people in the dental field, and in the process, gaining valuable insights and useful feedback pertaining to their clinical wants and needs.

Only a few years ago the majority of dentists remained unconvinced about reaching out online. Today, however, almost all are utilizing some kind of online presence to increase product sales and brand awareness, streamline office management, hire staff or keep current with patients. The big question is - are they doing it properly?

Online marketing is simply word-of-mouth powered by technology, and not really such a departure from traditional marketing methods such as print advertising, conference going or telemarketing.

How effectively does the global dental community embrace online marketing? Although some clinicians have become real social media sharks, most are simply not utilizing the medium to its best advantage. At MIS we like to Make it Simple, so let’s give some basic guidelines designed to help you become a more effective social media communicator.
A common mistake is to launch a social media campaign without having clear objectives. Forming a social network presence takes more than simply creating an account on Facebook or Twitter; and just because you’ve established a presence, doesn’t necessarily mean that your audience will follow.

Individual business objectives should be simple and straightforward: What do you hope to accomplish? Goals can focus on areas such as:

- **Product education**: Excited about a new product or treatment? Share it with others. Inform patients about promotions and introductory deals.
- **Practical advice**: You’re an industry expert, so use your specialized knowledge to engage and enrich your audience about topical issues, let them know you’re attending a symposium or conference and talk about it afterwards.

**FOLLOW A STRATEGY**: Get online and find out what interests your audience. Join professional groups and blogs to get a better idea of what readers in your field want, then create relevant content.

**DELIVER QUALITY**: Suitability and share-ability of your content is key to online marketing success. Readers must trust your content before they will share it, so make sure it’s relevant and factual, interesting and current; backed up by research, facts or real life experiences. Remember, sharing is what social media marketing is all about.

Whether it’s an article, video or still image, it must be presented well. Poor quality is your worst enemy. If a video link is broken, an article sloppy without spelling and grammar checks, or an image fuzzy and small, it won’t get shared, or worse - your visitors won’t return.

**REINFORCE ENGAGEMENT**: Engagement is what social media does best. Get your readers involved by posing questions or asking them to share their opinions and experiences. Don’t just post a link, create a short message that highlights the benefits of watching, reading and sharing. Be open to their responses. Even a negative response can be answered in a positive way - that’s authentic engagement.

**IN CONCLUSION**: MIS welcomes you to join us on Facebook or LinkedIn to see the latest product news, conferences, educational opportunities and one-of-a-kind company events. Via our YouTube channel, see product tutorial videos and informative promotional movies, with a continuous stream of new content added regularly. To get the big picture, check out the MIS website as well. It’s packed with information about our products, processes and innovations. We look forward to seeing you online soon.
WHY ROBOTS?

Robots differ from machines in that they can automatically perform specific mechanical functions without an operator. Although still requiring maintenance, a robot can carry out one or more pre-programed tasks in order to reduce the amount of human intervention required in production. Robotics systems are capable of processing different products through the same system and are reconfigurable for new products, thereby reducing costs and improving delivery flexibility.

There are many additional advantages to robotic systems, including uninterrupted production lines, accelerated manufacturing speed and consistent compliance with quality standards. Although robotic systems offer increased product quality and safety, MIS continues to perform a 100% visual inspection, both before and after the automated implants packaging stage. “Custom built for MIS, we needed cutting-edge robotically automated packaging equipment that could meet our stringent requirements in every respect; from the delicate handling of implants at high speeds to compliance with strict cleanroom specifications”, says Dror Sarig, head of MIS Engineering.

VISIONARY TECHNOLOGY -

The specialized software running the MIS robotic program is designed for fast, accurate feeding, sorting and sterile packaging of implants, with improved accuracy and efficiency.
including sensor-driven inspection equipment built-in to the process. Through vision-guidance technology the system becomes an excellent inspection tool; measuring critical dimensions, verifying features, providing product validation and traceability. Robotic systems can also be programmed to inspect and proofread labels as well as scan barcodes, a laborious job previously done by humans.

KEEPING IT CLEAN -

Implants manufactured from high-strength biocompatible materials, such as titanium, require a consistent defect-free surface finish because any irregularities can lead to reduced implant life. Robotic automated systems are especially effective in maintaining a contaminant free sterile packaging environment without any risk from human intervention. Robotic environments can also reduce the need for larger clean room facilities, reducing many of the peripheral costs associated with having people entering and exiting the sterile environment through air curtains or locks.

“As a leading global dental implants manufacturer, MIS understands the importance of innovation, not only in product development, but in every stage of the company’s large production chain”, continues Dror. “One of the key touch points is the automated feeding and packaging of dental implants for worldwide distribution.”
We look forward to meeting you at the 36th Annual IDS in Cologne, Germany on March 11-15, 2015. We're excited about showing you what's new & innovative at the MIS Booth: #B030, Hall 04.1. Learn more about MIS, visit our website: www.mis-implants.com