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IMPLANT INSTITUTE

# NEWSLETTER

DECEMBER 2022 / Vol 17



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## A Serious and Emerging Complication in Implant Dentistry: Ingestion or Aspiration of Implant Components

*By Randolph R. Resnik, DMD, MDS*

### Introduction

There exists an abundance of dental literature describing the ingestion or aspiration of foreign bodies such as teeth, orthodontic brackets, retainers, burs, crowns, posts, impression material, endodontic files, and syringe tips. Most recently, an ever-increasing complication associated with implant procedures is the loss of dental implant components (implants, abutments, screws, attachments, etc.) in the oropharynx resulting in ingestion or aspiration. Unfortunately, these foreign objects can be of various sizes and shapes which may lead to significant morbidity from displacement in the gastrointestinal (GI) or the respiratory tract. Therefore, when this complication occurs in a dental setting, the implant clinician must be well-informed on the appropriate management of the complication to avoid serious life-threatening and medicolegal issues.

### Etiology

Due to the small and atypical size of implants, abutments, screws, drivers, and other implant components, this complication may easily occur at any time during implant procedures (surgical and prosthetic). Implant procedures are highly susceptible to these complications because of the difficulty in handling of the small implant instruments and components that are often slippery due to saliva or blood. Most implant procedures, either surgical or prosthetic, are completed in a supine or semi-recumbent position which may predispose to ingestion or aspiration. In addition, other contributing factors include the use of local anesthesia which may result in the loss of the gag reflex mechanism, oral or intravenous sedation, unexpected patient movements during the procedure, poor visualization especially with patients with limited openings, and unexpected detachment of implant components. When an object is lost in the oropharynx, there exist two possibilities: the patient may swallow the foreign object into their stomach or



**Figure 1: Abdomen Plain Film Radiograph: depicting an implant driver in the stomach**



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aspirate foreign body into the lungs. Studies evaluating the prevalence of this complication have shown that approximately 80% of objects lost are ingested into the GI system and 20% are aspirated into the lungs. 1

### Ingestion:

In most cases, ingested objects into the gastrointestinal tract usually result in no immediate symptoms from the patient. Approximately, 90% of ingested objects usually pass through the gastrointestinal tract uneventfully in approximately four to six days, however irregularly shaped objects have been known to take up to four weeks. Studies have shown that objects will pass unimpeded through the gastrointestinal system (GI) in 80% of cases if the object is less than 3 cm. 2

The management of ingested objects most commonly depends on the risk for GI perforation and will usually result in either (1) periodic monitoring or (2) removal (via endoscopy or laparotomy). 3 Periodic monitoring will usually involve radiographic survey to ascertain the movement of the object. The perforation rate in the GI system is directly related to the size and sharpness of the object where sharp, pointed, an elongated objects have been reported to have an approximate 15 – 35% perforation rate. 4 (Figure 1)

### Aspiration:

In most cases, any foreign object that is aspirated into the lungs should be treated as a medical emergency.

The object could be located anywhere along the tracheobronchial tree, however the right bronchus is the most common site because of its more vertical and wider anatomic configuration in comparison to the left bronchus. [i] Usually, the patient will be symptomatic, exhibiting signs of laryngotracheal obstruction such as dyspnea, cough, wheezing, stridor or cyanosis. If airway obstruction is present, the clinician should immediately initiate CPR/Foreign body removal protocols.

Ideally, after location is confirmed, retrieval is necessary most commonly with flexible or rigid bronchoscopy. Bronchoscopy has been shown to be 99% effective in the removal of foreign objects, however 1% require surgical retrieval. Long term retention of the foreign body in the respiratory system can be life-threatening resulting from possible pneumonia, atelectasis, pneumothorax, hemorrhage, or lung abscess. (Figure 2)

### Prevention:

There exist numerous clinical strategies to avoid ingestion or aspiration of objects during dental implant procedures. It is imperative the dental implant clinician integrate specific prevention treatment techniques and



**Figure 2: Chest Radiograph showing aspirated cover screw into the right lung and implant driver into the GI tract.**

protocols to minimize the possibility of aspiration or ingestion of implant components. Unfortunately, there is no one technique that will guarantee this complication from occurring; however, extreme caution should always be exercised.

Techniques to prevent swallowing or aspiration include:

- *Patient Positioning:* For implant procedures with an increased risk of ingestion or aspiration, the patient should be seated in a more upright position instead of supine position.
- *Throat Packs or Pharyngeal Screens:* The easiest and most common technique to avoid ingestion or aspiration is the use of 4 x 4 surgical gauze. The gauze should be opened and positioned in the oral cavity distal to the area of treatment. A 2 x 2 gauze should never be used as saliva or blood impregnation may lead to the gauze being aspirated or ingested due to its small size. (Figure 3)

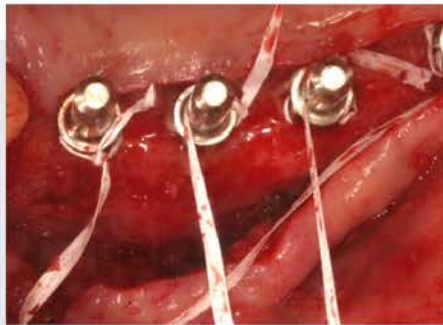


**Figure 3: Throat Pack - a 4 x 4 is placed posterior to the area of treatment to provide a barrier from foreign body loss**

- *Ligatures:* Floss or suture material should be tied to any possible implant component so easy retrieval may be completed if an object is lost into the oropharynx. (Figure 4)



**Figure 4: Ligatures - Floss tied to direction indicators to facilitate easy removal from the oropharynx.**



- *Special Insertion Tools:* Use of special screw insertion tools and drivers which allow for screw or implant insertion outside of the oral cavity. (Figure 5)



**Figure 5: E-Z Easy Driver (Salvin) - Specially designed implant drivers allow for insertion and removal of screws.**

- *High-Vacuum Suction:* used with a large aspirator aperture for the retrieval of foreign bodies that can be seen.
- *Curved Kelly Hemostat:* for retrieval of objects in oropharynx, ideally the hemostat should be located in operatory for easy access. (Figure 6)

**Figure 6: Kelly curved hemostats should be easily accessible to remove a dislodged implant component in the oropharynx**



- *O-Ring Replacement:* Periodic evaluation of O-ring components for signs of wear or material fatigue and replacement when warranted. (Figure 7)
- *Surgical Gloves:* Because of blood and saliva, it is not uncommon for surgical gloves to become slippery. Therefore, periodic glove replacement will prevent this complication.

If a foreign object is lost in the oropharynx, the patient should be instructed to not immediately sit straight up as this will ensure the ingestion or aspiration of the instrument. The patient should ideally turn to the side and attempt to “cough” the implant component up. If the foreign object is visible to the implant clinician, attempts to retrieve it with curved hemostats or a

**Figure 7: O-Ring Replacement - any implant driver or insertion tool that contains O-Rings should be periodically evaluated for material fatigue and retentive as they may detach from a thumb driver or torque wrench.**



high-volume suction is indicated. However, care should be exercised to prevent further displacement deeper into the oropharynx.

If the instrument is lost, immediate symptoms usually are a good indicator in determining if the foreign body was aspirated or ingested. If the patient exhibits coughing, wheezing, pain, and cyanosis symptoms, an immediate medical emergency protocol should be initiated as this is indicative of aspiration. If the patient is asymptomatic, which usually indicates ingestion, it is mandatory the patient be referred to their physician or emergency room for an immediate radiographs. Radiographic examination (usually chest and abdomen radiograph) is necessary for differential diagnosis of the location, size, and shape of the foreign body, as well as the need for immediate medical intervention

### Conclusion:

In summary, any object or instrument placed into the oral cavity during a dental implant procedure maybe ingested or aspirated. Although this has been characterized as an infrequent complication in the office setting, with the recent popularity of implant procedures, it is definitely an emerging problem and complication. It is imperative that clinicians have a strong understanding of the etiology and treatment of this complication along with integrating preventive protocols into their office for the treatment of implant patients. Radiographic imaging and medical attention is critical in the determination of the foreign objects location and the required course of medical treatment. If this complication is not treated properly, in a timely fashion and managed appropriately, life-threatening consequences may result.

Reprint from Dr. Resnik's article in Implant Practice <https://implantpracticeus.com/ce-articles/a-serious-and-emerging-complication-in-implant-dentistry-ingestion-or-aspiration-of-implant-components/>

[1] Abusamaan, M., Giannobile, W. V., Jhavar, P., & Gunaratnam, N. T. (2014). Swallowed and aspirated dental prostheses and instruments in clinical dental practice. *The Journal of the American Dental Association*, 145(5), 459–463

[2] El Wazani, Basma, P. Nixon, and C. J. Butterworth. "Accidental Ingestion of an Implant Screwdriver: A Case Report and Literature Review." *The European journal of prosthodontics and restorative dentistry* (2018).

[3] Black RE, Johnson DG, Matlak ME. Bronchoscopic removal of aspirated foreign bodies in children. *J Pediatr Surg*. 1994;29:682e684.

[4] American Society for Gastrointestinal Endoscopy. Guidelines for the management of ingested foreign bodies and food impactions. *Gastrointest Endosc* 2011;73:1085-91.

[5] Ireland AJ. Management of inhaled and swallowed foreign bodies. *Dent Update*. 2005;32:83–6. 89.



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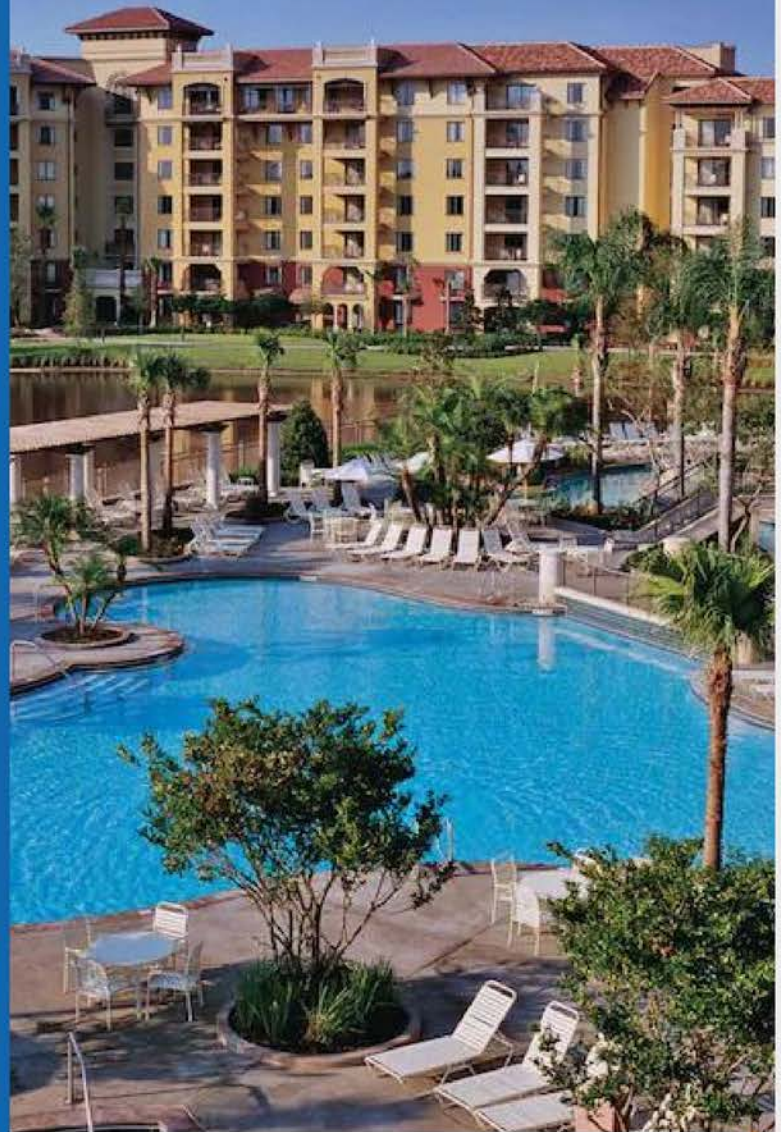
Bone Augmentation and  
Implant Placement into  
Compromised Sites

**MAY 19-20, 2023**

Treatment of the Posterior  
Maxilla: Osteotome and  
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**JULY 21-22, 2023**

Immediate Placement and  
Loading, Treatment of Peri-  
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*"98% of our  
graduates are  
placing Implants."*



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# MASTERING THE BUSINESS OF DENTISTRY

ROGER P. LEVIN DDS



*Hello Readers,*

*I am extremely excited to be providing a new column for the Misch Resnik Implant Institute newsletter. I have great respect for the educational importance of the Institute, and I hope that I will be able to contribute ideas on the business of dentistry and increasing practice production that will benefit all students and alumni. My own career as CEO of Levin Group began with one question that I am still asking 38 years later: How do you increase production in a dental practice while reducing stress? Based on this career-defining question, I look forward to providing relevant information that includes practical recommendations that can be implemented quickly to benefit all your practices. So, here we go. All the best, Roger*

## HOW EFFICIENCY INCREASES PRACTICE PRODUCTION

We all know that higher levels of efficiency help to increase practice production, profit, and income. But the real question is which types of efficiency can have the most significant effect?

Understanding efficiency

When I first entered practice consulting by launching a firm in 1985, the discipline was and still is referred to as management consulting. But if we go back 40 years earlier, the same discipline was referred to as efficiency consulting. This was pervasive in the business world because American businesses were desperate to increase product sales and the American economy was rapidly expanding.

Now here we are in 2022. The economy is not expanding rapidly, but businesses are still just as desperate to be more efficient. It seems that as they reach new levels of efficiency, they plateau for a while and then there is a drive to increase efficiency even further.

How does all of this relate to a dental practice? The truth is, and I say this with profound respect, dental practices are typically inefficient businesses. The simple data will prove this point. We know that almost all practices have a 30% to 50% growth potential in three years if systems are redesigned, waste is eliminated, and the team understands their jobs better.

So here is the million-dollar question. If most practices can increase production by 30 to 50% in approximately three years without adding any additional hours, wouldn't that indicate that the practices are currently operating at an inefficient level? Inefficiency doesn't mean bad or deficient performance. In fact (and I frequently lecture about this) when the economy is good, practices are doing well, the dentist income is sufficient, and the dentist and team are happy, it is understandable that the dentist is not pushing for higher performance. If you're relatively happy you don't go home every night spending time trying to figure out ways to increase production, profit, and income. At least that's true for most practice leaders.

But business is uncertain and will always go through cycles. Right now, we are going through a slight down cycle that contains some uncertainty. The economy could snap back and make everything easier, or it could slip further and make dental practice operations more challenging. Either way, the approach is to continually improve systems. In Levin Group's 30-year ongoing study of top 10% performing practices, we found seventeen principles that these practices have in common. One of them is a "continual improvement mentality." Regardless of how well these practices were doing, they were still working toward continual improvement. It wasn't necessarily about greed for most of these practices as much as it was about their enjoyment of improving the practice and being as efficient as possible.

### What is efficiency?

Efficiency is about achieving the highest-level result with the fewest steps, least people, and least amount of energy possible. For example, many practices could easily eliminate one full day a week and maintain the same production IF they became highly focused on implementing efficient systems along with their desire to work fewer hours.

The challenge is that even if you have excellent systems, they gradually get modified and revised and systems impact each other. The command-and-control system is scheduling. (cont'd pg 9)





# Misch Resnik Mastership

We are proud to be introducing our Mastership program at the Misch Resnik institute where we will be mentoring our doctors to become board certified with the ABOI. Our program consists of 300 CE hours, case presentations, and an oral exam all of which will have a focus on preparing for the examination process in the ABOI. Our goal is to help our graduates continue to distinguish themselves in their community and help them achieve board certification. For more information regarding our program, please email us at [MischResnik@gmail.com](mailto:MischResnik@gmail.com).



# Misch Resnik Fellowship

After successful completion of the following, you will receive a Fellowship Award from the Misch Resnik Implant Institute:

- Surgical Sessions S1 – S5
- Avoiding Implant Complications Course
- Completion of All Review Questions ( S1-S5 )
- Completion of the Fellowship Exam
- Completion of the Fellowship Exam Application

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## STUDY OF THE MONTH

### Does sinus augmentation alter patients voice and speech?

A recent study evaluated the effects of sinus augmentation procedures on voice and speech quality and resonance?

**Yes,** Changes in the perturbation parameters of acoustic sound analysis were found to be statistically significant. Therefore, this potential complication should be part of the patients informed consent when grafting into the sinuses.

Ungor, Cem, et al. "An acoustical analysis of the effects of maxillary sinus augmentation on voice quality." Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology 115.2 (2013): 175-184.

## TRIVIA QUESTION OF THE MONTH

How many Dentists are there in the United States?

What percent are specialists?



**~ 180,000.**  
**21% are specialists**



# IMPLANT QUESTION OF THE MONTH

What percent of patients currently taking herbal supplements failed to disclose this on medical histories?

- a. 20 %
- b. 40 %
- c. 60 %
- d. 70 %



D = 70%



## Misch Resnik Fellowship Award Recipients

2022

*The Numbers*

**104** GRADUATES

**71** FELLOWSHIPS

### 2022 December Recipients

- Dr. Fernando Archuleta
- Dr. Darren Dickson
- Dr. Alexandre Gaeta
- Dr. Bryce Miller
- Dr. Dean Trubschenck
- Dr. Huong Vu





If you do not get scheduling right your other systems will be limited in their potential, no matter what else you do. Again, you can still have excellent production and an excellent practice, but you will still be producing below potential. Another factor is the team. We do not constantly evaluate what they are capable of, how they are performing, and if they are hitting the designated measurements or targets that indicate excellent results. Instead, the longer your team is with you, the more complacent they become simply because they know their jobs, like their jobs, and do their jobs the in same way every day. But in a changing and more challenging world, jobs must change as well. That is what efficiency is all about. You must have the most efficient systems and train the team at the highest level. Practices that accomplish this goal will increase production every year, one of our highest objectives for all practices. If your production keeps going up, you will be fine and, over time be better than fine.

### Where to begin

Whether your practice is new or highly established, the place to begin is by selecting one system at a time and reviewing that system step-by-step. As an analogy, think about the way you manage implant treatment. You know all the steps to follow to achieve excellent quality and you follow a systematic process that allows you to be as efficient as possible. Then you follow new education from the Misch Resnik Institute and go back to your office and make improvements by inserting the new logistics into the implant system at specific steps.

The same is true for practice management systems. The system we typically advise starting with is scheduling because scheduling controls many other systems. If the schedule is not properly managed, then all other systems may be compromised. However, there are times that other systems are important to evaluate first if they are severely malfunctioning.

The best way to begin is by reviewing the steps of the systems. For example, Levin Group recommends that specific time is set-aside every day to reactivate any patients without their next appointments. This is a considerable time investment; however, top practices have patient bases that are approximately three times larger than the average dental practice. Therefore, we place a strong emphasis on reactivating patients without their next appointment to counter them being significantly overdue or gradually lost to the practice.

We recommend that practices set aside specific time every day to initiate first communication with overdue patients and follow up with a nine-week contact process that includes text messages, voicemails, and emails. The data clearly shows that this process works without overwhelming patients. The data is also clear that if this is a

consistent daily activity built into your scheduling system as a specific step, it will increase overall practice production gradually by as much as 20%. versus fatigue

### Efficiency versus fatigue

One additional goal of efficiency is to use the least amount of energy to complete a task. Dental practices are busy and often stressful environments and doctors, and team members are always in danger of experiencing fatigue or even burnout. One of the best ways to counter this is to work through practice systems, add beneficial steps, eliminate unnecessary steps, and apply measurements to determine if the right results are being achieved. This is what the best practices do. Systems are the foundation of the most extraordinarily successful businesses worldwide.

### SUMMARY

Efficiency is one of the single most crucial factors in the success of most businesses. Dentistry has “gotten away with” being inefficient due to good supply and high demand of patients, solid fees and level of reimbursements, and the overall economy. However, dentistry is changing and, like many businesses, has challenges ranging from increased competition to lower insurance reimbursements. Businesses, including dental practices, often face uncertainty and the best businesses still identify methods to continue to grow; however, those methods always require changes in practice dynamics, operations, and systems. The key is to make the systems as efficient as possible, which will increase production and reduce fatigue. One of the best ways to design a satisfying, successful, and enjoyable career is to maximize practice efficiency and develop a culture of continual improvement.

One more thought about efficiency...

If you would like to join the 30,000 dental professionals who receive Levin Group’s Practice Production Tip of the Day, please visit [www.levingroup.com](http://www.levingroup.com). Each short tip contains an idea for improving your practice and your life, many of which focus on becoming more efficient.

### ROGER P. LEVIN, DDS

*Roger P. Levin, DDS is the CEO and Founder of Levin Group, a leading practice management consulting firm that has worked with over 30,000 practices to increase production. A recognized expert on dental practice management and marketing, he has written 67 books and over 4,000 articles and regularly presents seminars in the U.S. and around the world. To contact Dr. Levin or to join the 40,000 dental professionals who receive his Practice Production Tip of the Day, visit [www.levingroup.com](http://www.levingroup.com) or email [rlevin@levingroup.com](mailto:rlevin@levingroup.com).*



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Treatment Planning, Socket  
Grafting, and Implant  
Placement

### OCT 19, 2023

CBCT BOOTCAMP

### OCT 20-21, 2023

Multiple Implant Placement  
and the Treatment of the  
Edentulous Ridge

### DEC 1-2, 2023

Bone Augmentation and  
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### JAN 26-27, 2024

Treatment of the Posterior  
Maxilla: Osteotome and  
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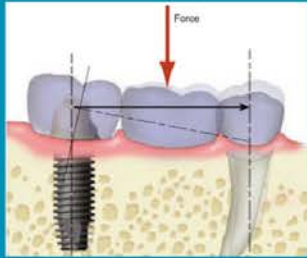
Immediate Placement and  
Loading, Treatment of Peri-  
Implant Disease

*"Our graduates show a  
22.5% increase  
in income in their first  
year after the course."*



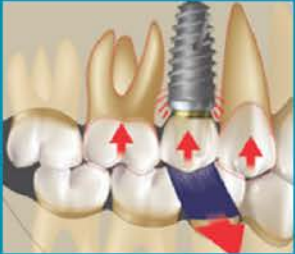


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*3 Day*

# PROSTHO BOOTCAMP FEB 9-11, 2023 DALLAS, TX



- Fixed and Removable Prosthetics in Oral Implantology
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- Screw vs. Cemented Prosthetics
- Impression Techniques for Fixed Prosthesis
- Biomechanics
- Occlusal Concepts for Fixed Prostheses
- Progressive Bone Loading for Fixed Prostheses
- Direct & Indirect Impression Techniques

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# See what past graduates are saying...

Dr. Resnik and his team are amazing! I took an extensive implant curriculum about 12 years ago and only placed the straight forward single or double implants since then. If you want to raise your implant game for your patients, your practice, and yourself - you don't have a choice: SIGN UP TODAY and you won't regret it! Cheers! -- **Dr. Chad Yenchesky**

The course gives you the confidence you need to place dental implants and allows you to meet like minded colleagues and instructors. \ Dr. Resnik is a great lecturer, keeps things interesting and presence scientific research to back up his claims. Most importantly the course will provide you with cook book instructions and protocols for everything you will encounter during your implant journey, from placement, to suture line opening to dealing with infections, consent form templates, medical clearance templates...etc. \. Strongly recommend! -- **Dr. J Chen**

This course gives you a comprehensive introduction to placing single, multi, and full arch implants mostly using guided techniques. This course is for anyone at any level. The audience is made up of beginners who have never placed an implant (like myself) to the well seasoned general dentists/ OMFS who has had years of experience placing implants. Best money I have spent to forward my career. -- **Dr. Natalie Sigwart**

I finished the 5-course curriculum just this past year. Dr. Resnik and the faculty are hands down the best in the business. The Misch/Resnik program gives you the education, tools, and the confidence to be proficient at implant dentistry. This curriculum gives you the knowledge and the skills to take your practice to the next level! -- **Dr Michael Buck**

Many thanks to Dr. Resnik and the Misch/Resnik Institute for their excellence and the quality of the surgical and prosthetic implant courses. I have gone through most of the courses a second time to my advantage, because they are always updated with new labs and lectures. THANK YOU! -- **Dr. Barb Leadbeater**

After 30 years of practicing dentistry, my only regret is that I did not get involved with implant dentistry earlier in my career, specifically with the Misch Institute. I never realized how rewarding and exciting for both me and my practice this could be. Dr. Randy Resnik and his entire staff are a major factor in this testimony! -- **Dr. Douglas Adel**

Dr. Resnik has an amazing depth of scientific based knowledge concerning his subject. He builds a very large zone of safety. If one stays within this zone the success rate will be maximized and complications will be extremely rare. -- **Dr. Terry Rigdon**

## Join the Family!

