

A CLINICIAN'S GUIDE TO HYBRIDS



*Everything the modern-day clinician needs to know!
Advanced workflows and innovative materials, the key to predicatability*

Dear Doctor,

My Absolute team and I have been involved with restoring implant retained hybrids since the introduction of the protocol in 2004. Over the last decade there has been an exponential increase in patient awareness and demand for these types of cases.

Many articles address the restorative value of prosthetically driven surgical plans combined with guided surgery and a latched conversion process. Absolute offers a fully comprehensive solution to treating these complex cases with predictable outcomes. True predictability is the result of a well-planned and pre-surgical diagnostically designed case. The Absolute NavaGation™ team uses this approved plan to design and fabricate surgical guides and a latched conversion. The entire process is done in-house to create a flawless workflow from planning to final delivery.

Initial workflows were unpredictable and restoring a hybrid was a daunting task, often requiring five or more appointments. Technology has transformed the way we restore these hybrids, making this protocol one of the most predictable in a clinician's arsenal.

In the past, material options were limited to denture teeth wrapped with acrylic over a titanium frame or weak and unaesthetic zirconia. Because of the inherent weakness in an acrylic and titanium combination, those hybrids were processed with additional bulk which ultimately lead to cleanability challenges.

Today, innovative restorative technologies and superior material options are providing innovative solutions while answering most of the questions clinicians had to deal with in the past.

I invite you to restore your next case with me and my Absolute team!

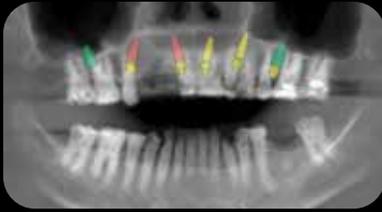
—Conrad J Rensburg



Conrad J. Rensburg
N.D. & N.H.D. Tech. Pret.

Hybrid Workflow

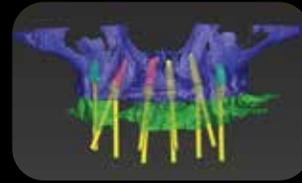
DIAGNOSTIC PLANNING & SURGICAL



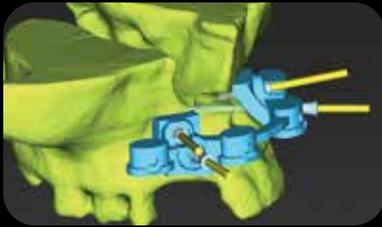
1. Scan patient and send DICOM to Absolute to plan and design



2. Every case starts with a digital diagnostic wax-up



3. NavaGation team will pre-plan case and schedule a remote review with surgeon and restorative teams



4. NavaGation team designs the guide and diagnostic conversion



5. Guides prepared, SLM milled and latched conversion ready for surgery



6. Guided surgery and immediate chairside conversion

BASIC RESTORATIVE PROCESS



7. Abutment level impression



8. Prototype/Transitional try-in fabrication



9. Prototype try-in



10. Digital/PVS impression of approved prototype



11. Milling of STL file in Nano-ceramics or Zirconia



12. Lab processing of final



FINAL DELIVERY

Restoring a Hybrid Prototyping—Analog Workflow

PREPARATION

Order appropriate abutment level impression copings and fabricate a custom tray with “window” to facilitate an open tray impression

FIRST CLINICAL APPOINTMENT - IMPRESSION

Remove the surgically converted temporary hybrid and expose the abutment level (FIG1). Engage the abutments using open tray impression copings (FIG2). Splint all copings together with an acrylic bridge for stability (FIG3). Flow a light body impression material between the acrylic splint and tissue. Overfill the impression tray with a medium body material. After seating the impression tray immediately wipe clean the impression pins to allow for identification and removal before lifting the impression (FIG4). Confirm accuracy of the impression by lightly pushing on the impression copings, no movement should be detected.

Lab Rx – Pour soft tissue model, provide model indexes for replication of the existing hybrid. Fabricate model verification jig

5-day turnaround



Fig. 1



Fig. 2



Fig. 3

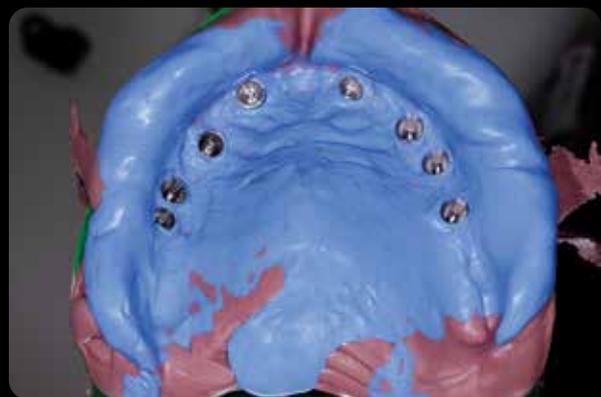


Fig. 4

SECOND CLINICAL APPOINTMENT – DATA CAPTURE

The temporary hybrid, delivered at surgery, gives the restorative team a diagnostic starting point and eliminates the need for a bite rim to establish a VDO.

Remove the conversion hybrid and place the verification jig on the abutments (FIG5). Secure with only one screw (pin) and radiographically or visually confirm interface seating. If there is a discrepancy, call the laboratory for further instructions. A passive fitting verification is crucial for a predictable clinical delivery. Please do not continue if the model cannot be verified.

If the model verified as accurate, place the converted hybrid on the model. A second model verification can be done by confirming accurate seating of the temporary hybrid on the model (FIG6). Screw the hybrid on the model using all screws and take an impression over the hybrid. This pick up impression can be done by using a large impression tray with medium body PVS or a laboratory putty. Please confirm pick up of the model indexing notches with impression material (FIG7).

Lab Rx – Replicate indexed hybrid and process hybrid prototype. Supply shade and diagnostic changes required to transitional hybrid. IMPORTANT NOTE: supply smile pics: (Full face, lips at rest, high smile and retracted)

Option 1 – Long term PMMA functional prototype. Can be used as emergency denture after delivery of final.

Option 2 – Printed prototype. Non- functional and only for try in purposes

10-day turnaround



Fig. 5



Fig. 6

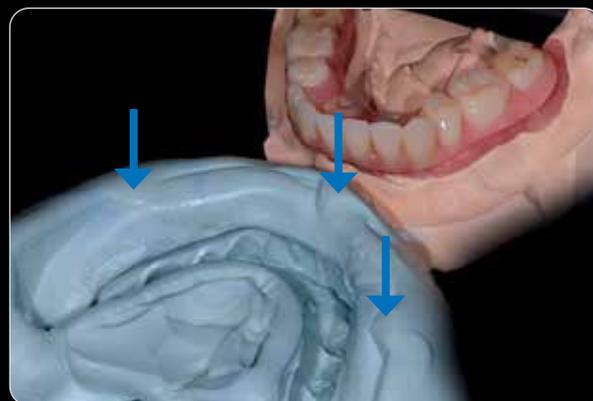


Fig. 7

LABORATORY PROCESSING OF PROTOTYPE

The laboratory will pour an acrylic replica inside the indexed impression in relation to the model (FIG8). This will provide a digital diagnostic starting point for the prototype try-in. The laboratory will now mount, digitize and make requested diagnostic changes to the replicated hybrid (FIG9). A remote review can be scheduled to discuss proposed changes and the diagnostic wax-up can be superimposed onto the patient smile pictures. After review approval, the lab will fabricate either a functional PMMA (FIG10) or printed disposable (FIG11) prototype. Although the wearable PMMA prototype adds a small cost to the case, it is highly esthetic and can be used to work out any bite or esthetic questions before proceeding to the final. This device also serves as a long-term emergency hybrid and is delivered with the final at delivery of the case.



Fig. 8



Fig. 9



Fig. 10



Fig. 11

THIRD CLINICAL APPOINTMENT – PROTOTYPE DELIVERY AND PATIENT SIGN OFF

Remove the temporary and seat the lab fabricated prototype.

Option 1 - Long term PMMA prototype / Emergency denture

This device can be delivered to the patient (FIG12) for medium term evaluation and required adjustments. Any adjustments, either adding or reducing, should be made directly to the prototype. After approval, remove and return the adjusted PMMA prototype to the lab for copy milling of final hybrid. If patient requests to remain in the prototype, simply place it on the soft tissue model and take a new indexing impression by repeating the same procedure as described under second clinical appointment.

Option 2 – Printed prototype

After seating (FIG13) make all required adjustments (bite, incisal edge etc.) and record any additional diagnostic requirements. Return the device to the laboratory for final hybrid copy mill fabrication. This device is not designed for intra oral use and should not be delivered as a functional device.

Please note the function of a prototype is to give the laboratory a copy-mill device for final hybrid fabrication. If any changes are required that could not be made directly to the prototype (or patient approval could not be achieved), PLEASE REQUEST AN ADJUSTED PROTOTYPE for try-in. As the final prosthesis will be an exact copy of the approved prototype, patient approval and sign off is crucial.

Lab Rx – Please process final hybrid 10-day turnaround



Fig. 12



Fig. 13

FOURTH CLINICAL APPOINTMENT – FINAL DELIVERY

This digital workflow guarantees that the final prosthesis will match the approved prototype exactly. To ensure an effortless delivery that will require very little, if any adjustments, it is crucial that processing is done in a fully digital, copy milled, workflow.



PMMA prototype



Zirconia prosthesis

DIGITAL WORKFLOW



Traditional tooth try-in



PMMA prototype



Green stage finishing



Post sintering



Final monolithic zirconia



Final delivery

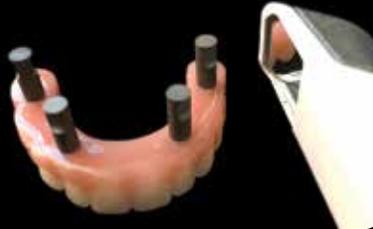
Restoring a Hybrid Prototyping—Digital Workflow

This workflow uses the data established by the transitional prosthesis (surgically converted denture) and greatly reduces the clinical time required while exponentially increasing the predictability of restoring a hybrid case. This workflow combines the traditional first three clinical appointments into one.

FIRST APPOINTMENT (Mostly done at implant check after healing)



1. Remove the transitional hybrid



2. Place scan flags (ordered from Absolute) and scan transitional hybrid



3. Replace transitional and scan opposing and bite – Send STL data to Absolute



4. Lab will now digitally produce a transitional replica and return to restorative clinician for indexing

SECOND APPOINTMENT (Final impression, model verification, bite and diagnostic try-in)



5. Place replica in mouth. Screw onto correction abutments and remove clear carrier



6. Lute between all implants with composite or tooth colored acrylic to verify impression



7. Adjust the bite and make any required diagnostic adjustments to the replica



8. Flow PVS impression into the intaglio surface of the replica to index the tissue level



9. Take smile pictures (low and high smile, retracted and at rest) and make diagnostic notes of required replica changes



9. Remove replica and return to the lab for prototype processing. Return the transitional to the patient

Lab will now use the indexed replica to:

- Place implant analogs
- Import the data provided into design software
- Pour abutment level soft-tissue impression
- Create prototype for final try-in, based off adjustments made to replica and diagnostic notes

Restoring a Hybrid Traditional Bite Rim Workflow

The following is a basic restorative case-flow protocol. This workflow does not utilize the data provided by a surgical converted prosthesis. Although every case is unique, this represents a standardized appointment schedule to restore a screw-retained hybrid.

FIRST APPOINTMENT

Clinical (1 hour)

Take an implant-level or abutment-level PVS impression. Generally, it is more predictable to restore a hybrid at abutment level, but there are options to restore at implant level. Please use an open tray impression technique if possible.

Splint impression copings with an acrylic/composite bridge to stabilize before taking the impression.

Lab (5 days in lab)

Pour a soft tissue model and fabricate a bite rim and model verification jig. To save on cost, Absolute utilizes the impression copings to fabricate a verification jig.

SECOND APPOINTMENT

Clinical (45 minutes)

Verify model accuracy by hand placing the verification jig into implants or onto the abutment-level. Verify by lightly placing the jig. Do not screw the verification jig down, this will flex the jig and not identify any possible issues.

Register a bite, as if fabricating a denture. Bite rim will be processed without vestibule, please verify patient does not require vestibule support. If vestibule support is required, a fixed hybrid is not the correct solution (see options in this manual). Request shade and mold.

Lab (5 days in lab)

Process a digital set-up and print a PMMA try-in or set up a wax based tooth try-in for patient approval and bite verification. Absolute offers 2 options in PMMA try-in materials.

- Disposable, printed, non-functional PMMA
- Transitional, milled PMMA. Deliver as a long-term emergency denture with final prosthesis

THIRD APPOINTMENT

Clinical (30 minutes)

Tooth try-in and bite verification. Patient approval on final esthetics, shade and tooth position. Choose restorative option based on patient-specific needs.

If patient is unsure, the transitional PMMA can be worn to fine-tune bite and expectations. It is important NOT to go to final until 100% patient approval is achieved. The goal is never to have adjustments at final delivery!

Lab (15 days in lab)

Lab will fabricate final prosthesis and return for final delivery.

FOURTH APPOINTMENT

Clinical (45 minutes)

Delivery of final prosthesis and transitional long-term emergency PMMA emergency denture - if requested

Hybrid Technologies of the 21st Century

Guided Surgery with Diagnostic Conversions—The link to predictable restorations

By utilizing today's digital technologies, Absolute's NavaGation Team can now preoperatively plan implant cases from a true diagnostic perspective. A digital diagnostic foundation is the gold standard, and no case, whether complex or basic, is planned without it. Implant placement is determined by considering the proposed diagnostic work-up, final prosthesis and available bone. Implant placement is then approved as a team by the surgeon, restorative clinician and technician. This process eliminates any financial and restorative surprises after surgery. When a case is planned and processed using guided surgery techniques, the conversion denture becomes a true diagnostic prototype. This creates a valuable starting point which allows the restorative clinician the ability to process a fixed hybrid in as little as two clinical appointments.



Hybrid Prototyping—The key to a predictable restorative outcome

The biggest modern-day advancement in restorative protocols is the ability to produce and try-in a digitally archived prototype. This allows for a true diagnostic try-in that can be adjusted and digitally replicated for the final prosthesis. Hand processes, such as layering ceramics or setting teeth, have been a huge hindrance to creating a predictable hybrid workflow. Incorporating a predictable, fully digital workflow became a reality with the introduction of the latest high strength/high esthetic zirconia materials and nano-ceramics. This allows the modern-day dental laboratory to digitally archive all prosthetics, allowing for effortless remakes. This digital process has increased the clinical predictability of restoring a hybrid tenfold.



One Hybrid—Two appointments

Through strategic partnerships, Absolute now offers clinicians the ability to digitally scan the implant retained conversion denture at implant recall. This data is used to combine the traditional impression, bite registration, tooth try-in and model verification appointments into one. This predictable process allows the team to fabricate the prototype or final prosthesis into two clinical appointments.

Hybrid Materials of the 21st Century

Monolithic Occlusion with a Digital Workflow—The future of hybrids

Having the ability to archive a restoration has greatly reduced costly remakes and saves valuable clinical chair time. Combining a full digital workflow with a monolithic occlusion has positively impacted the life expectancy and predictability of the modern hybrid. These two factors make up the foundation of a predictable hybrid treatment process.

Double cross-linked PMMA

These advanced materials are giving the dental lab the ability to create a functional and highly esthetic prototype. When Absolute processes a prototype we offer the clinician two options:

- Printed prototype for try-in purpose only.
- Dual purpose milled prototype. Try-in device and delivered as an emergency hybrid.

Advanced PMMA materials are used to create a prototype that closely resembles the final hybrid in function as well as esthetics. These materials can also be used for long-term transitional hybrids to address economical concerns.



Nano-ceramics in lieu of Wrapped Acrylic

10mm minimal vertical clearance

This material methodology has evolved from shaky beginnings to a highly trusted and very valuable restorative option. The modern-day nano-ceramic materials are 70/30 blend of silanated glass and advanced polymers.

Absolute has replaced the old school wrapped acrylic over titanium with a far superior monolithic nano-ceramic tooth structure supported by a carbon acetal frame.

Nano-ceramics offers:

- Monolithic occlusion
- Digital workflow and digital archiving
- Prototyping for predictability
- High-end esthetics



Monolithic Zirconia

10-12mm minimal vertical clearance

Zirconia, not unlike most other innovative materials, has undergone an extreme transitional evolution over the last 15 years. Modern zirconia offers both high strength as well as transitional translucency, making it a highly dependable hybrid material. With a complete digital workflow, from diagnostic to prototype to final, this is truly THE material of the 21st century.

- Strong monolithic occlusion
- Complete digital workflow
- High end esthetics in modern zirconia
- 1200+ MPA strength



Layered Ceramics over a CoCr substructure

5mm minimal vertical clearance if metal occlusal is used – 8mm with layered ceramics

This material truly defines high-end artistry, superb esthetics and extreme function in surgically compromised cases. This option still depends on “old school” hand layering and therefore does not offer a complete digital workflow. As a result, the final prosthesis cannot be digitally archived.

The value in this material lies in its superior strength when faced with limited vertical clearance and in its ability to still deliver high-end esthetics, even in compromised situations. CoCr is Absolute’s “get out of jail” material. It can be processed with technology that controls and redirects the screw-access. The combination of digital and analog processing allows the technician to process the case with metal occlusal or lingual surfaces if required.

- Superb esthetics
- Position screw-access without correction abutments
- Can be processed in as little as 4mm vertical
- Superb accuracy with milled CoCr structure



Layered Ceramics over CoCr



Artistry by Haesoo Kim

Hybrid Friction Denture – Vestibule support with Fixed Function

12-15mm minimal vertical clearance around implant sites

Many patients are planned for a fixed hybrid prosthesis, only to realize they require vestibule & lip support that cannot be accommodated by a hybrid. Other patients are unhappy with the function of a Locator® supported denture and some clinicians are concerned with the cleanability of a fixed hybrid on the upper.

This protocol bridges the gap between fixed function, cleanability and vestibule support. It gives the patient the ability to remove and clean the denture, while the prosthesis still functions like a fixed hybrid. This hybrid requires four internally hexed implants, 12mm of vertical clearance around the implant sites and can be processed on most popular implant systems. Furthermore, Absolute offers digital archiving of the final denture and sleep denture for predictable remakes.

- Fixed function with a removable option
- Digital archiving of denture for efficient remakes
- Fulcrum adverse friction fit
- Functional even with shallow AP spread
- Processed with or without vestibule and/or palate



Clip-bar with Removable Denture

10-12mm minimal vertical clearance

This was the restorative protocol of choice before the term “hybrid” was even coined. Unfortunately, the protocol was plagued by failures mostly caused by casting and welding discrepancies. The Dolder bar technique fell out of favor early in the 2000’s. This restorative protocol was resurrected with the launch of CAD design and titanium milling processes.



Locator F-Tx Fixed Attachment

8-10mm minimal vertical clearance

This innovative solution provides the clinician with an affordable, yet very functional hybrid solution. No screws equates to no screw-access issues and therefore the ability to restore the case directly onto the F-Tx abutment. The F-Tx hybrid is a true fixed hybrid solution offering the clinician the ability to remove the hybrid for hygiene and maintenance.

- Economical fixed hybrid issue
- No screw equates to no screw-access issues
- Chairside or indirect pick-up



Locator R-Tx Clip Attachment

8-10mm minimal vertical clearance

The Locator R-Tx is an improved version of the original gold colored Locator Legacy clip component. The Locator R-Tx system can now accommodate up to 30 degrees of divergence and offers a greatly increased pivot technology.

- Increased divergence correction
- Simplified patient seating and alignment



Signature Marabittic Zirconia



Artistry by Ueda Hiroo

Restoring a Hybrid

Restorative Options & Frequently Asked Questions

Capturing the data provided by the converted or transitional hybrid can save the restorative team multiple clinical appointments. It is especially useful to establish a base-line bite and tooth position. This eradicates the need for multiple tooth try-in appointments and unneeded chair-time. Absolute, using today's technologies, can very effectively copy this data, add diagnostic changes and process the try-in prototype or final prosthesis.

All the options below require a transitional hybrid converted at or after surgery.

Option 1 – Requires digital scanner

Digitize transitional in STL as described on previous page.

Option 2 – Requires access to chairside lab support or same day processing

Simply remove the existing transitional, take impression, pour the soft-tissue model and use the hybrid to mount and index position on an articulator. Take a study-cast impression of the existing hybrid and return to the lab with diagnostic instructions to copy.

Option 3 – Two stage approach – No access to immediate chairside lab processing

Take an abutment level impression and send to the lab. The lab fabricates a soft-tissue model and returns it to the clinician. When the patient returns, remove the transitional and screw it back on the soft-tissue model. Take a PVS impression over the hybrid on the soft-tissue model. The lab will now create a copy of the transitional in relation to the soft-tissue model. This copy will be used to digitally produce a prototype for try-in and patient approval.

FREQUENTLY ASKED QUESTIONS – Answers based on author research and will vary by region and affected by other factors

What is the average charge per arch for a fixed hybrid supported by four or five implants?

The average charge was between \$22,000 and \$27,000 per arch, from surgery to final depending on the case and final prosthesis

What is the average restorative fee for a hybrid?

The average fee was between \$12,000 and \$16,000

What is the average lab bill for a hybrid?

Most average hybrids are processed for between \$4,000 and \$5,000

How much time should I allow from initial impressions to final delivery?

Most cases are processed in six weeks or less depending on patient availability

Can I restore at fixture level?

Yes, but it sometimes severely complicates the restorative process. Abutment level is highly recommended

If the verification jig does not fit, what do I do?

The verification jig is processed by using the original impression copings, so it can be used again for the correction impression. Separate the jig between the copings, screw it back onto the abutments, lute the pieces together and take a new impression by picking up the jig inside the new impression

Open or closed tray impressions?

Always use open tray impression posts, except if the implants are in severe undercut. In that case, use a combination of open and closed tray impression posts. Use open tray on all implants with draw, and splint those components if possible. To allow for removal of the impression tray, use closed tray impression posts on the implant that are in undercut



Signature Artistry by Jack Marrano

Nano-Ceramics Upper & Lower Zirconia

ABSOLUTE DENTAL LAB

Established in 1994, Absolute Dental Services started as a small fixed prosthetics lab in the Triangle area of North Carolina. More than two decades later, Absolute's restorative focus is much broader but their attention to product detail and exceptional customer service has not changed.

Today, Absolute is a true full-service partner, with a team nationally and internationally renowned for their expertise in creating world-class esthetics. Their use of cutting edge technology in CAD and milling as well as their extraordinary dental implant, guided surgery and high-end removables sections, enables them to deliver lifelike and functional dental prosthetics in even the most complex cases.



The company motto, *Perfection Is Not Optional*, holds true and serving their customers with Absolute Excellence has always been the primary focus of the owners, branch partners and team members. They welcome clinicians from all over the country to become part of the Absolute family!

CONRAD J RENSBURG N.D & N.H.D in technology

Conrad J Rensburg is owner and head of the dental implant division at Absolute Dental Lab in the Triangle region of North Carolina. He graduated under full scholarship with a 4-year Baccalaureate degree from Pretoria Tech in 1992. He is certified with an ND in technology and specialized with an NHD in fixed prosthetics. He is a member of the AO, ACP and prestigious PEERS prosthodontic association. He is registered with the NADL, NCDLA and certified by the SADTC. He has specialized in fixed dental prosthetics with an emphasis on dental implants since the early 90's. As a CE-accredited speaker since 2002, he has presented at hundreds of events across the USA, including the Academy of Osseointegration, Global and US symposiums, World Summit Tour and a multitude of study club events. Conrad's emphasis as a speaker is on keeping today's clinicians abreast with the latest advancements in screw-retained and hybrid implant retained and supported options. As author of multiple published articles, his focus is on CAD implant design protocols and fixed as well as removable hybrid implant supported techniques. Conrad can be contacted at conrad@absolutedentalservices.com.

JACK MARRANO CDT – Director of Signature Prosthetics

Jack is the Director of Absolute Dental Services Signature Prosthetics Division in the Triangle area of North Carolina, A former Marine, Jack started his ceramics career in 2002. He managed the Implant, All Ceramic and PFM Divisions of MicroDental DTI. He was Director of technical Artistry for Lee Culp at Sculpture Studios, before joining Absolute Dental Laboratory. He has completed courses on advanced implant restorative dentistry with Dr Carl Misch and has received a Fellowship from the Misch Institute as well as obtaining Fellowship and Mastership from the International Congress of Oral Implantologists. He is a member of the Academy of Osseointegration, the American College of Prosthodontists and the prestigious PEERS prosthodontic association. He was also named one of the top 40 technicians in the US under 40 by LMT. Over the years, Jack has been an integral part in the research and development of many of today's top restorative dental materials. Jack has studied and restored cases with many of the world's top clinicians. Today, he continues to work closely with Restorative Clinicians, Prosthodontists, University Graduate programs and faculty Practices from around the country. Jack can be contacted at jack@absolutedentalservices.com.



Perfection
Is Not
Optional!



Monolithic zirconia

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