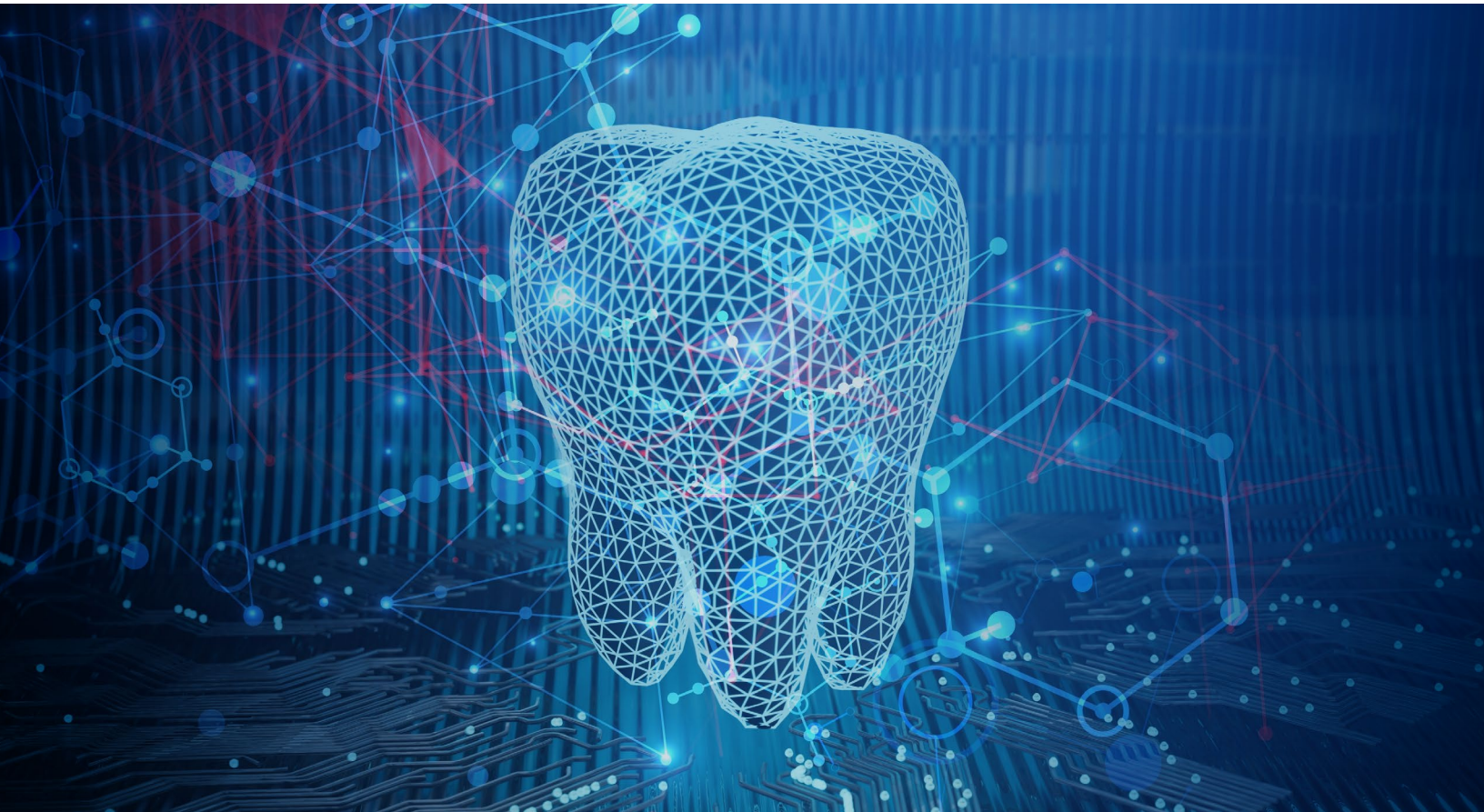


Dental **PRODUCT
SHOPPER**

Adhesive Dentistry Is **an Exact Science**

*Are you treating it like one? Understand the knowledge, materials,
and techniques that separate a good bond from a lasting one.*



Getting Bonding Right Every Single Time

Knowing the science behind bonding and working with a trusted, research-focused company will help ensure you create long-lasting bonds, every time.

When adhesive dentistry first went mainstream, dentists were primarily placing composite restorations. That isn't the case anymore. Today, dentists have a wide range of substrates to work with and, to be successful, must understand how to properly bond to each of them—as well as to tooth structure itself. Using the wrong technique or an incompatible adhesive can lead to real problems down the road, including sensitivity, secondary decay, and failed restorations.

That reality, Dr. Gary Alex said, makes it critical for dentists to become "extremely proficient in adhesive dentistry." Dentists must understand the intricacies of each substrate involved and how those substrates interact with different bonding agents.

"When it comes to adhesive dentistry, knowledge is power," Dr. Alex said. "Understanding the materials you are using, why you are using them, and having at least some idea of what they are actually doing can only make you a better dentist."

COMMON BONDING MISTAKES

- ❌ Not reading the IFU—every adhesive has its own protocol.
- ❌ Inadequate air-drying leaves residual water that weakens the bond.
- ❌ Contamination from blood or saliva can undermine many adhesive systems.
- ❌ Mismatching materials from different manufacturers risks compatibility failures.
- ❌ Skipping the primer on zirconia, metal, and other indirect materials.



Gary Alex, DMD

"When it comes to adhesive dentistry, knowledge is power."

The payoff is practical: you'll be able to choose the best technique and bonding agent for each substrate, leading to better patient outcomes, BISCO Manager of R&D Technology Dr. Qiang Ma said. It's also worth remembering that not all adhesives are created equal—each has its own protocol, making it essential to read and follow the manufacturer's instructions for use (IFU).

And, unfortunately, not every material is as effective as the company behind it claims. Do your research, and take your business to a company you know you can trust.

A Research-Driven Partner for Every Bond

BISCO has been a leader in adhesive dentistry since its founding 45 years ago by Dr. Byoung Suh. From the start, Dr. Suh's vision was clear: build a company rooted in research, dedicated to understanding the science of adhesion, and committed to sharing that knowledge with the dental community.

Today, the company remains committed to optimizing bonds, said Dr. Rolando Nuñez, BISCO's Clinical Marketing Manager. Products like Z-Prime Plus were developed to strengthen bonds to specific substrates, and BISCO formulates its lineup to work seamlessly together—as well as alongside materials from other manufacturers. For example, All-Bond Universal, a go-to adhesive for many clinicians, is compatible with any material in any technique.

"Every time we share a protocol, we know it's going to work," Dr. Nuñez said. "Our founder, Dr. Suh, was a firm believer in testing, developing, and sharing information on how to bond to different substrates and do so in the most optimized way. We're still doing that today."

What It Takes to Build a Better Adhesive

How a research-driven founder, a groundbreaking product, and decades of relentless science built a standard the industry still follows today.

Adhesive dentistry has come a long way—from the weak, unreliable materials of the 1970s and '80s to the streamlined, universal solutions available today. The shift to truly universal systems began in the 1990s when BISCO introduced All-Bond 2, the first complete adhesive system specifically designed to be used in a total-etch capacity.

Dr. Alex, who was introduced to BISCO around that time, described All-Bond 2 as a "groundbreaking product," with its success paving the way for later products that raised the bar even higher. The innovative product also "firmly established Dr. Suh as one of the most knowledgeable, renowned, and respected members of the research and adhesion community."

Changing the Way Dentists Work

"All-Bond 2 changed the way people were practicing dentistry," Dr. Nuñez said, "and from there the evolution of dental adhesives began. BISCO is an important part of that evolution, offering products that simply make restorative dentistry better."

The team at BISCO has remained at the forefront of dental adhesives with an eye toward addressing common pain points. Dr. Nuñez noted that All-Bond Universal—a single-bottle system that doesn't require an activator—became the first truly universal adhesive material on the market when it was released in 2012. And while other universal adhesives have followed, All-Bond Universal has remained an industry leader and the gold standard with a fiercely loyal following.

"BISCO's key scientific breakthrough was Dr. Byoung Suh's vision of what adhesive dentistry was going to become," Dr. Ma said, "and focusing our efforts on developing technology and products that will serve the dental community and enhance the standard of care."

The Keys to Predictability

When it comes to predictable bonding, developing the right formula is critical. One of the main differences in BISCO products like All-Bond Universal is lower water content. While water is a necessary



THE WEAK LINKS

A successful bond depends on getting every step right. The chemistries in adhesive systems are sensitive to a surprising number of variables—the hydration state of dentin and enamel before application, application time, material manipulation, air-drying duration, and factors related to light polymerization including wavelength, intensity, collimation, technique, and duration. Contamination from blood or saliva can compromise many systems as well.

Think of it as a chain.

"The late Dr. John Gwinnett—a highly respected academician, researcher, dentist, mentor, and teacher—taught his students to think of a bonded restoration as a chain: a series of links that together form a bonded assembly," Dr. Alex said. "And very much like a chain, our bonded restorations are only as strong and durable as the weakest link."



adhesive ingredient, it's difficult to remove before polymerization—and any water left behind may become trapped in the hybrid and adhesive layers, impacting polymerization.

Because of its low water content, All-Bond Universal only takes 10 seconds to air-dry. Other materials take longer, and many dentists simply don't wait long enough before moving on to light curing.

"Lower water content is the No. 1 most critical thing," Dr. Ma said. "If there's any residual water left on the adhesive after it's light cured—if there's still water at the interface and you're bonding on top of it—it won't be a durable bond."

All-Bond Universal also contains the 10-MDP phosphate monomer, which is known for its hydrophobicity (it's also a feature that gives All-Bond Universal the ability to bond to all composites, resin cements, zirconia, and other substrates). Its stable hydrophobic interaction with collagen enhances the bond, and that results in longer-lasting restorations. If materials



"In my experience, if you follow the instructions, you're going to be fine regardless of who makes the material you're using."

— Rolando Nuñez, DDS

aren't hydrophobic enough, water will penetrate over time, impacting the bond.

"All-Bond Universal is optimized for bonding from the start," Dr. Ma said, adding that the product also features a mild pH—further ensuring its compatibility with any material on the market.

The Right Technique

Following the proper steps is also critical to a successful bond, Dr. Nuñez said. BISCO develops techniques in its labs to ensure dentists receive the most optimized protocols to bond to specific substrates like zirconia. These techniques are built into the manufacturer instructions dentists should follow every time.

Deviating from the protocol can lead to

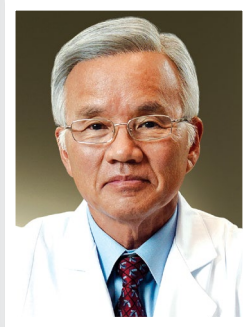
a host of problems, including sensitivity, a weak bond, and ultimately, debonding.

Dr. Ma noted that manufacturers spend significant time writing and reviewing detailed and accurate IFUs. These differ from adhesive to adhesive, and therefore should never be disregarded.

"The IFU provides the best way to mitigate any risks," Dr. Nuñez said. "Dentists need to be familiar with how to use their material of choice, how to properly dispense it, its working times, its setting times. Sometimes people want to get creative, and that can become a problem. In my experience, if you follow the instructions, you're going to be fine regardless of who makes the material you're using."

THE BOOK ON BONDING

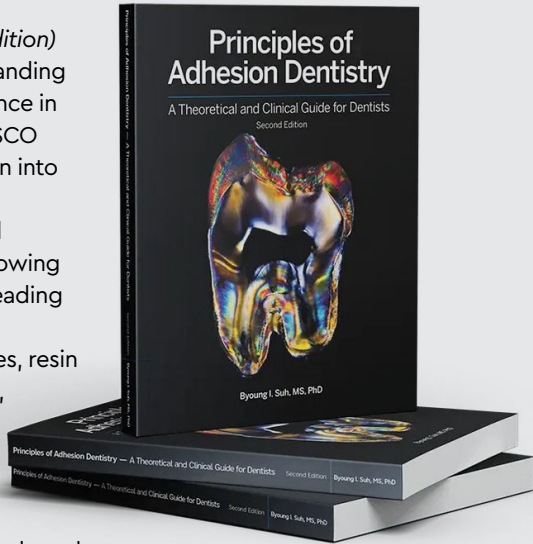
Released in 2025, Dr. Byoung Suh's *Principles of Adhesion Dentistry (Second Edition)* is an indispensable resource for dental professionals who want a deeper understanding of dental materials and their clinical applications. Drawing on decades of experience in teaching, research, and product development, the BISCO founder distills the complex science of dental adhesion into practical, operatory-ready knowledge.



Each chapter is structured into three parts—Clinical Significance, In-Depth Information, and Summary—allowing both seasoned clinicians and students to tailor their reading experience and learn at their own pace.

The book covers adhesive and bonding technologies, resin systems, comparative evaluations of current products, and restorative protocols—a rare combination of chemical insight and clinical relevance that connects material science to real-world application.

"Dr. Suh's *Principles of Adhesion Dentistry (Second Edition)* represents the consolidation and encapsulation of a lifetime of teaching, knowledge, research, and product development," Dr. Alex wrote in the book's foreword. "It is important for dentists and those interested in dental materials to read this book because the longevity and predictability of almost all dental restorative procedures is wholly predicated on the ability to predictably bond various materials to tooth tissues." [Visit **biscobookstore.com** to purchase.](https://www.biscobookstore.com)



The Details Make the Difference

Bonding failures rarely happen by accident—they happen when technique slips, products are mismatched, or the science gets ignored.

It's one thing to place a bonded restoration; it's an entirely different thing to place a bonded restoration that will be durable over time.

Dentists struggle with bonding failures for many reasons, with micro-leakage, nanoleakage, hydrolysis of the interface, poor clinical technique, and inadequate polymerization among them, Dr. Alex said.

"Durable adhesive dentistry is an exact science," he said, "and attention to the smallest details can be the difference between clinical success or failure."

The More You Know

Dentistry changes rapidly, Dr. Ma said, and the pace of new material releases introduces real compatibility risks that many clinicians underestimate.

"There are so many new materials out there, there might be some incompatibility. You might use a new method to bond, but how does that affect the old composites, the old cements? The only way to know if you're using products correctly is to understand the basic chemistry behind them."



Dr. Qiang Ma

"The only way to know if you're using products correctly is to understand the basic chemistry behind them."

All adhesive systems have their own specific placement and handling idiosyncrasies, Dr. Alex said, and what works well for one system may not work for another.

"It is incumbent upon all dentists to learn about the specific adhesive system they are using—its idiosyncrasies, strengths, and weaknesses, and how to maximize its performance," he said. "Even good chemistry will not overcome poor clinical technique."

Leading the Evolution

"We're always researching; it never ends," Dr. Nuñez said. "We are part of restorative dentistry and have helped write the restorative dentistry story over the last 45 years."

BISCO INNOVATIONS MOVING DENTISTRY FORWARD

Z-Prime Plus: A single-component priming agent that significantly enhances bond strength to zirconia, alumina, and metal substrates. Contains both the MDP phosphate monomer and BPDM, a carboxylate monomer.



All-Bond 2: The first complete adhesive system specifically designed for use in a total-etch technique—and the product that established BISCO as a leader in adhesive dentistry.

All-Bond Universal: The first truly universal adhesive compatible with any composite and any technique. The one-bottle system features low water content, a mild pH, the 10-MDP monomer, and requires no activator.

Duo-Link Universal: A dual-cured resin luting cement indicated for permanent cementation of all indirect restorations, endodontic posts, and cement-retained implant restorations.

TheraCem: A dual-cured, calcium and fluoride-releasing, self-adhesive resin cement for luting crowns, bridges, inlays, onlays, and posts.



ADDITIONAL RESOURCES

