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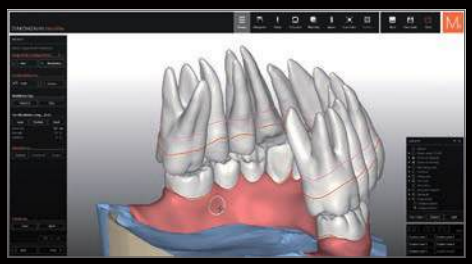

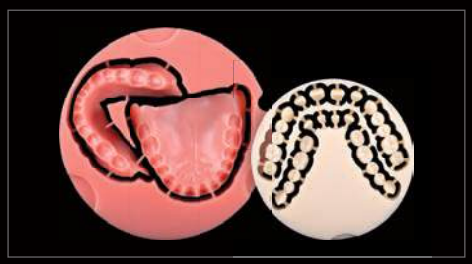

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Website:
www.palmerimediagroup.com

SPECTRUM DENTURISM ISSN# 1921 5932 is published six times a year and distributed to Denturists across North America. The journal is committed to presenting cutting edge education in order to optimize patient care.

Publication Dates:
January/February, April, June/July, August/September, October, December

Printed in Canada
Canadian Publications Mail Product Sale Agreement 40020046

SPECTRUM denturism

In this issue

October 2025 • V19N5

Carlo Zanon,
DD, LD, FCAD

The Power of Engagement in Denturism

The profession of Denturism has long been rooted in service, skill, and compassion. Yet, the strength of our profession is not measured solely by the quality of care we provide in our clinics – it is equally defined by how we engage with one another as colleagues and as advocates for our profession. The benefits of stepping forward, sharing knowledge, and taking on leadership roles are immense, not only for the profession as a whole but for each individual Denturist.

When Denturists become more active – whether through writing articles, mentoring new professionals, or presenting ideas at meetings – they help to strengthen the foundation of our field. Sharing experiences and expertise builds a collective knowledge base that elevates the standard of care across the profession. It also fosters pride in knowing that our voices contribute to the growth of Denturism and the betterment of the patients we serve.

> These organizations are the heartbeat of Denturism in Canada, advocating for our interests and ensuring that our profession continues to thrive.

Equally important is participation in our provincial associations. These organizations are the heartbeat of Denturism in Canada, advocating for our interests and ensuring that our profession continues to thrive. Membership alone is valuable, but stepping up to serve as an elected board member carries an even greater impact. It allows us as Denturists to guide the direction of the profession, influence policy, and ensure our voices are heard at the highest levels.

The pride of being an active Denturist lies not only in our own personal achievements but also in the legacy we create for those who follow. By mentoring, writing, sharing, and leading, we shape the future of Denturism. Let's all strive to get involved. ■

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AT-A-GLANCE

DENTURIST 1


Alex Zlatin, CEO Mint Ops &
Savannah Koran, Director of Operations Mint Ops

9:00am - 10:00am

Staffing And Hr Management For A Thriving Dental Team

10:00am - 10:30am | Exhibit Hall Break

Tanya Little, Denturist

10:30am - 11:30pm

Thoughts From A Denturist, Creating Dentures For 20 Years!


Milan Jovanovic & Francesca Girardo, RDT, DD

11:30am - 12:30pm

Implant-Supported Dentures From Start To Finish:
A Denturist's Perspective

12:30pm - 1:30pm | Exhibit Hall Lunch Break

Philip Segal

1:30pm - 2:30pm

Denture Conversion Simplified: The Easypro Protocol For Predictable Outcomes Practice

2:30pm - 3:00pm | Exhibit Hall Break

Dean Fenwick

3:00pm - 4:00pm

Artificial Intelligence - Powered Practice Management With Domx


Alex Chabachevitch, RDT **& Andreas Klie,** RDT

4:00pm - 5:00pm

Integrating Photogrammetry in Intraoral Procedures

5:30pm - 7:00pm | Cocktail Reception

DAO -PYP PROGRAM

Mallory Potter, Executive Director at DAC

9:30am - 10:30am

The Non-Insured Health Benefits (NIHB) Program, Dental Benefit– An Overview

10:30am - 11:00am | Exhibit Hall Break

Pam Rehm, RDT

11:00am - 12:30pm

Optimizing Digital Denture Design for Milling: Material Insights and Workflow Efficiency

12:30pm - 2:00pm | Exhibit Hall Lunch Break



(From left to right) **Zahra Vaid, Olivia Hynes, & Lindsay Kary**

2:00pm - 3:00pm

Dealing With A Clinical Complaint Or Audit? Now What? Best Practices For Documentation And Protection

3:00pm - 3:30pm | Exhibit Hall Break

Youhanna Salib, Director of Consulting Services at IPAC Consulting

3:30pm - 4:30pm

Protect Your Practice: A Denturist's Guide to Acing IPAC Audits

Renee Robinson, Manager of HR and H&S Consulting

4:30pm - 5:30pm

Know Your Role: Health & Safety Legal Duties for Denture Clinic Owners

5:30pm - 7:00pm | Cocktail Reception

AT-A-GLANCE

TECHNICAL 1



(From left to right) **Karim Sahil,** RDT, MDT
Christopher Ji, RDT
Mrs. Judith Rigby
9:00am - 10:00am

Peer Circles And Professional Excellence– The RDT Is The Subject Matter Expert And Voice Of The Profession

Dora Rodrigues, DT
10:00am - 11:00am

Fast and flawless : Mastering The Full Arch Digital Workflow

11:00am - 11:30am | Exhibit Hall Break

Jennifer Dibben, RDT
11:30am - 12:30pm

"Just Build A Digital Workflow," They Said. "It'll Be Great," They Said...And It Can Be– If You Know The Whole Story

12:30pm - 1:30pm | Exhibit Hall Lunch Break

Karim Sahil, RDT, MDT
1:30pm - 2:30pm

Dental Technologist - Dentist Simplifying Modern Day Ceramics Using Technology.


Alex Chabachevitch, RDT **& Andreas Klie,** RDT
2:30pm - 3:30pm

Finding New Solutions To Our Everyday Challenges In The Everchanging Dental World

3:30pm - 4:00pm | Exhibit Hall Break

Mark Chan, DD
4:00pm - 5:00pm

Vita Vionic Dentdisk: Uses And Applications In The Modern Day Lab

5:30pm - 7:00pm | Cocktail Reception

TECHNICAL 2

Kaveh Shams, DT
9:30am - 10:30am

Minimal Thickness, Maximum Aesthetics, Exploring Prettau® Skin® Veneers in Clinical and Lab Practice

10:30am - 11:00am | Exhibit Hall Break



(From left to right) **Eyal Geiger,** CEO of 3D Prime Tech
Mr. Fatih Arikcan
Helen Tran, RDT
11:00am - 12:00pm

A New Streamlined Workflow For Partial & Denture Digital Design & 3d Printing Production Powered By Exocad, Imes-Icore & Trumpf

12:00pm - 1:00pm | Exhibit Hall Lunch Break

Michael Suris, CDT
1:00pm - 2:00pm

Advancing Digital Denture Workflows: Techniques for Precision and Efficiency

Kevin Stuart
2:00pm - 3:00pm

"Better Air Quality Makes Dollars And Sense" What You Really Need To Know

3:00pm - 3:30pm | Exhibit Hall Break

Andre Gaul, CDT
3:30pm - 4:30pm

3d Printing In The Lab: Improving Results


Dr. Bobby Baig
BDS., AEGD., Cert Prosthodontist., F.R.C.D.(C). **&**
Leonid Gurgov, CDT
4:30pm - 5:30pm

Lab Communication And Prosthetic Errors And Their Consequences In Implant Dentistry

5:30pm - 7:00pm | Cocktail Reception

AT-A-GLANCE

IMPLANT POWER HOUSE

Dr. Mark Bishara

9:00am - 10:00am

Full Arch Therapy: To Fp1 or to Fp3 Clinical Failures & How to Avoid Them

10:00am - 10:30am | Exhibit Hall Break

Dr. Lesley David, DDS, Dip. OMFS

10:30am - 11:30am

Digital Implant World Simplified for the GP

Dr. Omid Moghaddas, DDS, MSC Board Certified Periodontist in Iran

11:30am - 12:30pm

Road to Success in Esthetic Implantology

12:30pm - 1:30pm | Exhibit Hall Lunch Break

Dr. Rick Ferguson, DMD, ABOI, DICOI

1:30pm - 2:30pm

3D Printing in the Dental practice – Current Applications

Dr. Moemen Metwally, DDS, FAGD, AFAAID

2:30pm - 3:30pm

Mastering the Atrophic Maxilla: Predictable Solutions for the Unsalvageable

3:30pm - 4:00pm | Exhibit Hall Break

Dr. Mark Nicolucci, DDS, MS, FRCD(C)

4:00pm - 5:00pm

Implants in 2025: an Update for Dentists

5:30pm - 7:00pm | Cocktail Reception

CLINICAL 2

Dr. Larry Gaum, DDS, FADSA, FICD, FADI

9:00am - 10:00am

Complications In Oral Surgery Are Real Things That Can Happen To Anyone

10:00am - 10:30am | Exhibit Hall Break

(From left to right) **Dr. Izchak Barzilay,** DDS, Cert. Prostho, MS, FRCDC
Dr. Effrat Habsha, BSc, DDS, Dip Prostho., MSc, FRCDC
Dr. Elahe Behrooz, DDS, MBA, DDS, MSc (Prostho), FRCDC
Dr. Mahmood Abu Ruja, DDS, PhD, MSc (Prostho), FRCDC
Dr. Parvaneh Bahrami, DDS, MSc (Perio), FRCDC, ABP Dip, Board Certified in Canada and US
Dr. Majid Zakeri, Prosthodontist

10:30am - 12:30pm

Complications in Dentistry – How to avoid and deal with them

12:30pm - 1:30pm | Exhibit Hall Lunch Break

Tara Doster, MBA

1:30pm - 2:30pm

Bonding and Cementation Demystified

Dr. Amelia Edmonds, DDS & **Dr. Yolande Truong,** DDS

2:30pm - 3:30pm

Temporomandibular Disorders: Evidence-Based Approaches and Strategies for Patient-Centered Management

3:30pm - 4:00pm | Exhibit Hall Break

Dr. Mark Safari

4:00pm - 5:30pm

Optimizing Dental Implant Success through Platelet Concentrates and Biologics

5:30pm - 7:00pm | Cocktail Reception

AT-A-GLANCE

CLINICAL 3

Dr. Shammick Kotecha, DDS
9:30am - 10:30am
Digital vs analog: where are we today

10:30am - 11:00am | Exhibit Hall Break

Dr. Soheil Khojasteh, BHSc, DDS, MSc, Diplomate ADBA
11:00am - 12:00pm
Analgesia and Pain Control in Dentistry

12:00pm - 1:00pm | Exhibit Hall Lunch Break

Dr. Claude Martel
1:00pm - 2:00pm
Introducing e.max Prime Zirconia in the day to day CEREC Practice

Tarek Sharkas, DDS, MDS, Cert Prostho, FRCD(C)
2:00pm - 3:00pm
"The Tale of Two Implants" Why One Failed and One Succeeded

3:00pm - 3:30pm | Exhibit Hall Break

Jennifer Turner
3:30pm - 4:30pm
Data Driven Hygiene

5:30pm - 7:00pm | Cocktail Reception

DIGITAL WORKFLOW

Dr. Azeem Sheikh, DDS
9:00am - 10:00am
Immediate Molar Implants - Digital workflow from start to finish

10:00am - 10:30am | Exhibit Hall Break


Dr. Joseph Fava, Prosthodontist &
Karim Sahil, RDT, MDT
10:30am - 12:30pm
Simplifying digital workflows from single tooth implant to full mouth reconstruction.

12:30pm - 1:30pm | Exhibit Hall Lunch Break

Dr. Waji Khan, CD, BSc, DDS, MBA, MEd
1:30pm - 2:30pm
CBCT use for the General Practitioner in Dentistry; How this Techology can improve your clinical game!


Mark Chan, DD &
Dr. Jason Adinata, HBSc DDS AEGD, MSc
2:30pm - 3:30pm
Using Digital Dentistry to Solve Everyday Aesthetic Challenges in General Dentistry

3:30pm - 4:00pm | Exhibit Hall Break

Dr. Pax Forghani
4:00pm - 5:00pm
Integrated Workflow For Full-Arch Prosthetics

5:30pm - 7:00pm | Cocktail Reception

AT-A-GLANCE

CORE 1

Dr. Peter McDermott

DDS, Associate Director – Quality Improvement and the Implant Coordinator at the Schulich School of Medicine and Dentistry

9:00am - 12:30pm

Fundamentals of Dental Recordkeeping

10:00am - 10:30am
Exhibit Hall Break

12:30pm - 1:30pm
Exhibit Hall Lunch Break

Dr. Parvaneh Bahrami

DDS, MSc (Perio), FRCDC, ABP Dip, Board Certified in Canada and US

Dr. Rana Badewy

PhD, FRCDC

1:30pm - 4:30pm

Applied Dental Recordkeeping

3:00pm - 3:30pm
Exhibit Hall Break

5:30pm - 7:00pm
Cocktail Reception

Eligibility: To register for the afternoon lecture, you must have completed the "Fundamentals of Dental Recordkeeping" in the morning session, or have previously taken the course on July 31 or October 30 with RCDSO

BUSINESS FORUM

SHAW Lab Group

AT-A-GLANCE

SHAW Lab Group


Ali Zare, *Chief Security Officer, TASProvider* and Ozhan Asi

9:00am - 9:50am

AI in Digital Marketing & Cyber Security in Dentistry

Dr. Brandon Bosch, *DDS, CEO of Dr. Marketing*

9:50am - 10:50am

How To Make Marketing Work For You

10:50am - 11:20am | Exhibit Hall Break

Timothy A. Brown, *Broker of Record, CEO of ROI Corp*

11:20am - 12:10am

The Master Class to plan, control and execute your exit strategy

12:10pm - 1:10pm | Exhibit Hall Lunch Break

Tala Batarseh, *Dentala Consulting Founder*

1:10pm - 2:00pm

Culture and Strategy: How Dental Leaders Can Shape Practice DNA

Dr. James Younger, *DDS, Author at TempStars*

2:00pm - 3:00pm

The Business Case for Positive Workplace Culture in Dentistry

3:00pm - 3:30pm | Exhibit Hall Break

Adil Kotadia

3:30pm - 4:20pm

Navigating practice growth in today's digital world.

Amy Tong, *CLU, CHS, CH.F.C RCIS*

4:20pm - 5:10pm

Dentists: How to Tax Shelter Investment Income and Build a $3 Million Tax-Free Capital Dividend Account in Your Dental Professional Corporation

5:30pm - 7:00pm | Cocktail Reception

BUSINESS FORUM POWERED BY

SHAW Lab Group

Arbnor Saraci

Lukas Wichnalek

Norbert Wichnalek

The "Print is Dead" Myth

We live in a time of virtually boundless knowledge. Information flows constantly and in ever-growing quantities from all kinds of channels—film, television, radio, print media, the internet, social media, word of mouth, and more. The jungle of information is becoming ever denser and more impenetrable. To stay clear-headed and focused in this jungle, each of us must face the personal challenge of distinguishing what is important from what is trivial, what is credible from what is not.

This challenge applies just as much to our professional information landscape. For nearly 150 years, our primary sources of professional knowledge have been textbooks and trade journals—supplemented more recently by the vast channels of the World Wide Web. The various social media platforms flood us with professional content on every conceivable topic, but in a chaotic and disorganized manner. Most recently, a sensationalist slogan has spread across social media in barstool fashion: **"Print is dead."** The desired message? That textbooks and professional journals are obsolete, have no place in the modern world, and are being replaced by social media. So goes the wishful thinking.

There are indeed dental and dental technology platforms on social media where so-called "posts" are published instantly and without any form of professional or scientific vetting. While some posts are excellent, the majority are frankly just trash.

Trade journals, on the other hand, have **scientific advisory boards** — professional oversight bodies. Every article is impartially and critically assessed, reviewed, and, if necessary, corrected for its alignment with the current state of the art. Everything that is published must pass through this filter, with all submitted content also examined on ethical and moral grounds. Social media, by contrast, is a playground without rules. Just consider: on social media, the theory that "the Earth is flat" is actually taken seriously in some circles.

> **Many users of social media don't remember the next day what kind of professional content they consumed yesterday.**
>
> — *Norbert Wichnalek*

People tend to read a textbook or trade journal with intention, often in a relaxed setting — conditions that engage the long-term memory. On social media, by contrast, our attention is rapidly switched from one topic to the next, severely shortening our attention span. We are increasingly unable to focus or remember something for any meaningful period of time. Many users don't remember the next day what kind of professional content they consumed the day before. That's because they're texting or surfing the web while working, working out, or watching TV. This leads to **sensory overload** and fragmented attention. Our brains can't cope with this constant media barrage — and certainly not our long-term memory.

The Göttingen-based neurobiologist Gerald Hüther puts it succinctly:

"The inability to distinguish the important from the unimportant... that is the hallmark of digital media."

To remember something is to be attentive. Social media are like **Ephemeroptera** — mayflies — while print media are like long-lived turtles. In summary: **a toast to long-term memory and the joys of relaxed reading.** ■

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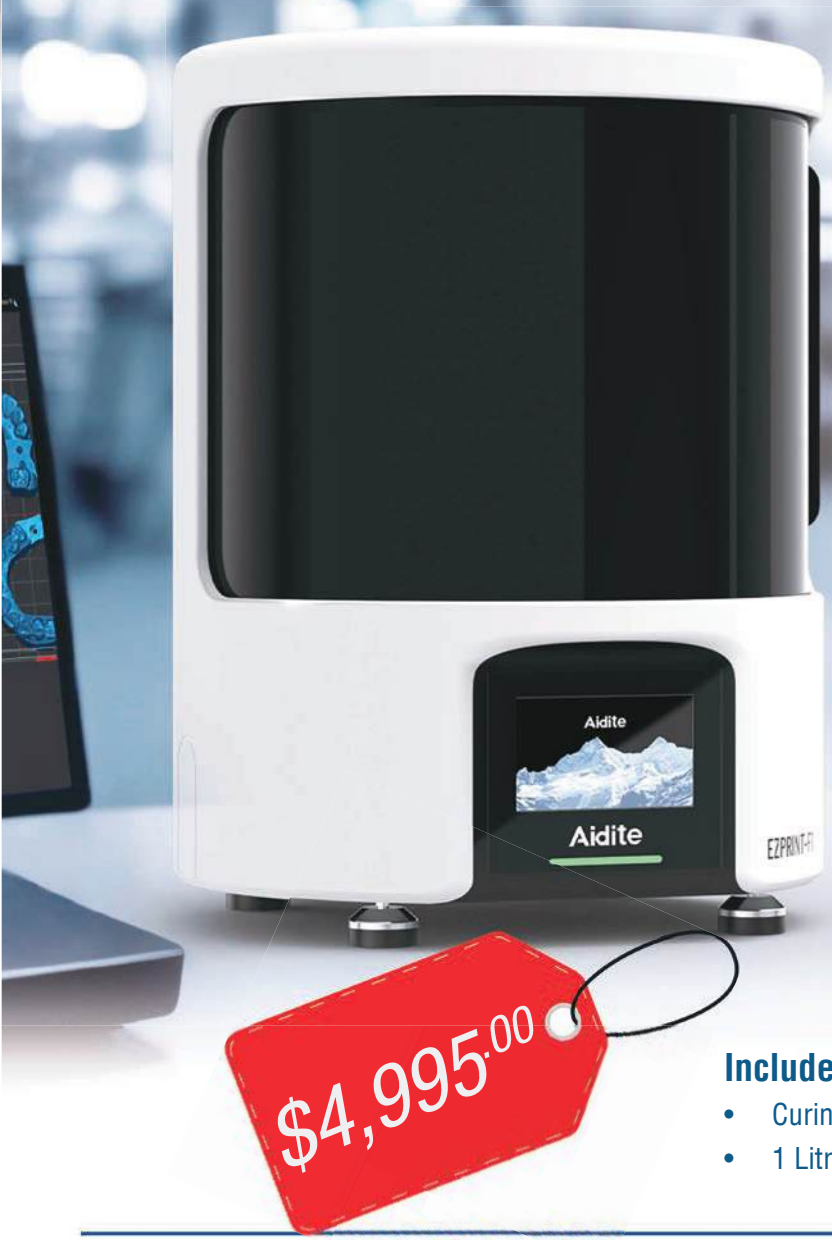

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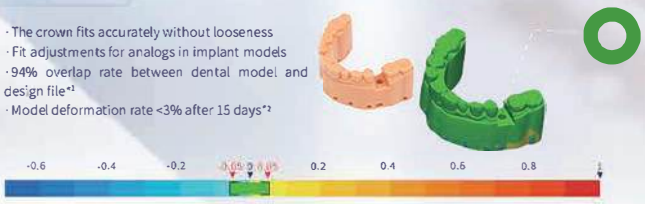

*1: Scanning after the dental model is printed, and comparing with the design model data
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Patient Acquisition and Marketing for Denturists

As a denturist in Canada, attracting new patients is critical to the growth of your practice. While word of mouth remains a powerful tool, a comprehensive patient acquisition strategy focused on digital marketing is necessary to stand out in today's competitive environment. Here's how denturists can implement a targeted marketing approach to boost patient acquisition.

1. Digital Marketing: A Vital Strategy for Growth

With more patients turning to the internet to find dental and denture services, a strong digital presence is crucial for success.

- **SEO and Website Optimization:** For denturists, ensuring your website is optimized for local search results is critical. Patients searching for denture services in your area should be able to find your practice easily. SEO is a long-term strategy, but it's one of the most effective ways to attract patients over time.

- **Paid Search (Google Ads):** Paid advertising, particularly through Google Ads, can give your practice a quick visibility boost. By targeting individuals searching for dentures or dental services near you, paid ads allow you to attract patients who may need urgent or specialized services. Working with a professional can help reduce the cost per lead and improve the efficiency of your campaigns.

2. Email Campaigns

Email marketing is one of the most cost-effective ways to engage with potential and existing patients. It allows for direct communication, keeping your denture practice top-of-mind. A well-planned email campaign should focus on:

- **Personalized content** – Sending targeted emails based on patient needs or service preferences increases engagement and conversion rates.
- **Regular touchpoints** – Monthly newsletters, special offers, and patient education emails help maintain a strong connection with your audience.
- **Automation and tracking** – Using platforms like Mailchimp or Constant Contact enables automated appointment reminders, follow-ups, and performance tracking to optimize future campaigns.
- **Call to action** – Every email should include a clear next step, such as booking an appointment, leaving a Google review, or exploring new services.

When done correctly, email marketing strengthens relationships, builds trust, and contributes to long-term patient retention.

3. Social Media: Building Relationships and Trust

While social media is often used by dental clinics, denturists can also benefit from building a presence on platforms like Facebook and Instagram. These platforms allow you to educate potential patients, showcase transformations, and share helpful tips.

- **Engagement and Education:** Post before-and-after photos, success stories, and articles about denture care to keep your followers engaged. Educational content helps build trust and position your practice as an expert in denture-related services.
- **Local Engagement:** Denturists typically serve a local population, so engaging with your local community on social media can build trust and encourage patient referrals.

4. Print Advertising

While digital marketing dominates modern patient acquisition strategies, print advertising remains a valuable tool—especially for reaching local audiences who may not be as engaged online. A well-executed print campaign should focus on:

- **Targeted placements** – Ads in community newspapers, local magazines, and industry publications (such as dental or healthcare directories) ensure visibility among the right audience.
- **Consistent branding** – Using the same logos, colors, and messaging across print and digital channels helps build recognition and trust.
- **Compelling offers** – Featuring promotions, new patient specials, or educational content in your print ads can encourage potential patients to take action.
- **Tracking effectiveness** – Using unique phone numbers, QR codes, or promotional codes in print ads allows you to measure response rates and adjust strategies accordingly.

Although print advertising requires a higher upfront investment than digital methods, it can be a powerful way to establish credibility and attract patients who prefer traditional media.

5. Google Reviews and Word of Mouth

Word of mouth remains one of the most effective ways for denturists to acquire new patients. After all, most people trust the opinions of friends and family over advertisements. Encourage your satisfied patients to leave Google reviews, which will help improve your practice's online visibility and reputation.

- **Encouraging Reviews:** Politely ask your patients to leave reviews after their treatment. The more positive reviews you have, the more likely prospective patients will choose your practice over others.

6. Monitoring Your Marketing Efforts

As with any marketing strategy, tracking and analyzing your results is key to optimizing your patient acquisition plan. Use tools to monitor the source of your leads and measure the conversion rates from digital campaigns. This will help you refine your marketing approach and allocate resources more effectively.

Conclusion

For denturists in Canada, developing a well-rounded patient acquisition strategy is essential to growing your practice. By incorporating SEO, paid search, social media, and Google reviews into your marketing efforts, you can increase visibility, build trust, and attract new patients. Tracking and refining your approach will ensure long-term success in a competitive market. ■

Brian Binnie

Mastering Communication Skills: The Do's and Don'ts of Professional Dialogue

In any organization, communication is the thread that holds everything together. Whether it's a simple exchange between colleagues, a team brainstorming session, or a challenging conversation with a client, how we communicate directly affects workplace relationships, productivity, and the quality of our work.

While we often focus on technical expertise and task completion, the ability to communicate effectively—clearly, respectfully, and strategically—can be the difference between conflict and collaboration, confusion and clarity. The good news? Communication is a skill. And like any skill, it can be developed with awareness and practice.

Here's a comprehensive guide outlining the key do's and don'ts of workplace communication that can help create a more productive and respectful environment.

1. Listen First

Do: Give others your full attention before responding.

Don't: Interrupt or assume you already know what they're going to say.

Listening is the foundation of communication. It signals respect, fosters trust, and ensures that your responses are relevant and thoughtful. Active listening involves more than just hearing words—it means taking in the tone, body language, and intention behind what's being said. Avoid formulating your response while the other person is still speaking. Instead, focus on absorbing their message completely.

2. Be Clear and Concise

Do: Get to the point using straightforward language.

Don't: Overcomplicate or include unnecessary details.

Clarity prevents misunderstandings and saves time. When you speak or write, keep your message focused and digestible. Use short sentences and simple words where possible. Avoid jargon or overly technical language unless your audience is familiar with it. Rambling or veering off-topic can dilute your message and create confusion.

3. Ask Clarifying Questions

Do: Confirm your understanding by asking open-ended questions.

Don't: Pretend to understand or make assumptions.

When in doubt, ask. Clarifying questions like "Just to make sure I understand…" or "Can you elaborate on that?" demonstrate engagement and

a genuine desire to comprehend the message fully. They also help uncover details that may not have been communicated clearly in the first place.

4. Be Mindful of Your Tone

Do: Speak in a calm, measured, and respectful manner.

Don't: Let frustration or sarcasm slip into your voice.

Tone of voice is a powerful part of communication. The same words can have drastically different meanings depending on how they are delivered. In tense situations, a neutral tone can de-escalate conflict. Always aim for constructive dialogue—even during disagreements.

5. Maintain Appropriate Eye Contact

Do: Use natural eye contact to show engagement and interest.

Don't: Avoid eye contact or, conversely, make it feel like a stare-down.

Good eye contact helps build trust and rapport. It shows you're present in the conversation and paying attention. That said, overdoing it can feel intense or intimidating, while avoiding eye contact can make you seem disinterested or evasive.

6. Adapt to Your Audience

Do: Adjust your communication style based on who you're talking to.

Don't: Use the same tone or method for every situation or person.

Communicating with a client, a senior manager, or a new team member each requires a different approach. Consider the other person's background, familiarity with the topic, and preferred communication style. This flexibility demonstrates emotional intelligence and enhances mutual understanding.

7. Stay Open-Minded

Do: Be willing to consider different perspectives.

Don't: Shut down ideas simply because they differ from your own.

In team settings, disagreements are normal—but being open to other viewpoints is key to innovation and effective problem-solving. Listen with the intent to understand, not just to reply. Being receptive doesn't mean you have to agree, but it shows respect for others' contributions.

8. Practice Active Listening

Do: Show you're engaged by nodding, summarizing, and using verbal cues.

Don't: Zone out or appear distracted.

Active listening involves giving visible or audible signs that you're paying attention. Phrases like "I see," "That makes sense," or brief summaries of what the other person said can keep the conversation flowing and show you value their input.

9. Be Aware of Body Language

Do: Use open, relaxed gestures to put others at ease.

Don't: Cross your arms, fidget excessively, or turn away from the speaker.

Non-verbal cues often communicate more than words. Being aware of your posture, facial expressions, and gestures—and interpreting others' body language—can improve the effectiveness of your interactions.

10. Choose Your Words Carefully

Do: Think before you speak, and aim to be constructive.

Don't: Use emotionally charged or careless language.

The words we choose can either strengthen relationships or damage them. Even when giving feedback or addressing issues, framing your message in a respectful and objective way helps maintain professionalism and avoids unnecessary friction.

11. Disagree Respectfully

Do: Express differences in opinion calmly and constructively.

Don't: Get defensive, raise your voice, or become dismissive.

Disagreements are inevitable, but how we handle them matters. Focus on the issue, not the person. Use "I" statements, avoid blame, and always aim for resolution rather than escalation.

12. Pay Attention to Non-Verbal Cues

Do: Observe posture, expressions, and tone to read the full context.

Don't: Ignore signs of confusion, discomfort, or disengagement.

If someone looks puzzled or uneasy, it may mean they haven't fully understood or agreed with what's being said. A simple, "Does that make sense?" or "How do you feel about this?" can invite helpful feedback.

13. Avoid Jargon

Do: Use clear language, especially in mixed or external audiences.

Don't: Overuse acronyms or technical terms without explanation.

Jargon can be useful shorthand—but only if everyone understands it. When in doubt, err on the side of clarity. This is especially important when working cross-functionally or communicating with clients.

14. Respond Thoughtfully

Do: Pause to think before replying.

Don't: React impulsively or emotionally.

Taking a moment to consider your response not only reduces the chance of saying something regrettable but also shows maturity and professionalism.

15. Follow Up and Summarize

Do: End conversations with clear next steps or a brief recap.

Don't: Leave meetings or discussions without alignment.

Following up ensures shared understanding and accountability. It also helps prevent miscommunication down the line. A simple email or meeting summary can go a long way.

Final Word

Good communication doesn't happen by chance—it's the result of intentional habits practiced over time. By committing to these do's and don'ts, we can strengthen our professional relationships, avoid misunderstandings, and contribute to a more respectful and productive workplace.

Whether you're a team leader, a new hire, or somewhere in between, strong communication is your most valuable soft skill—and it's one worth investing in. ■

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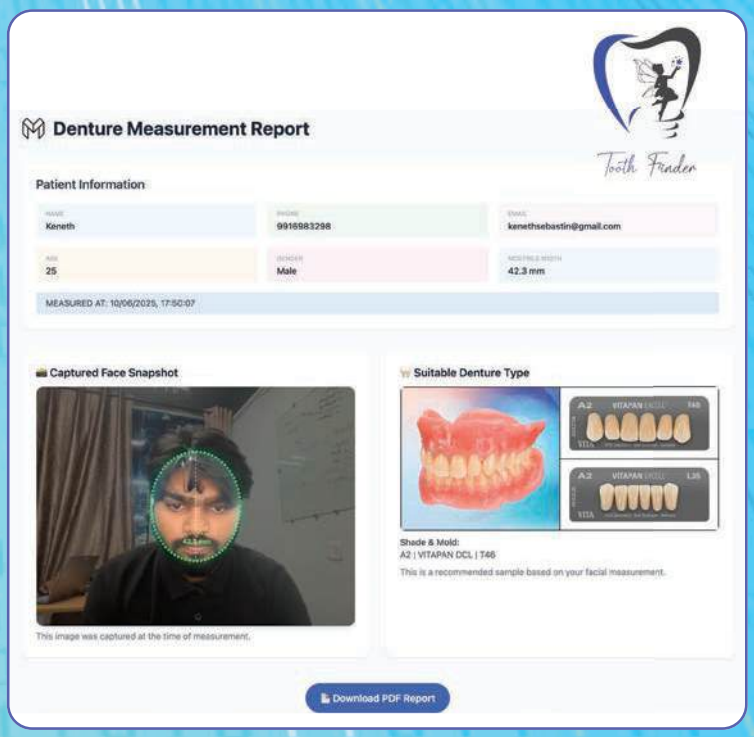

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Temporomandibular joint dysfunction: a simple guide

Yad Zang discusses his clinical approach to diagnosing and managing TMJ problems in patients

Over a number of years working in various oral and maxillofacial surgery departments, I have seen a significant number of patients complaining from many symptoms. Yet of all these diseases and conditions, one condition in particular seems to be so often misdiagnosed - or goes undiagnosed completely.

There is one anecdote from my own experience that sums this up perfectly.

Some years ago, l saw a lady who, over the course of 18 years, had been through the full spectrum of medical specialties, including neurology, ENT and many others.

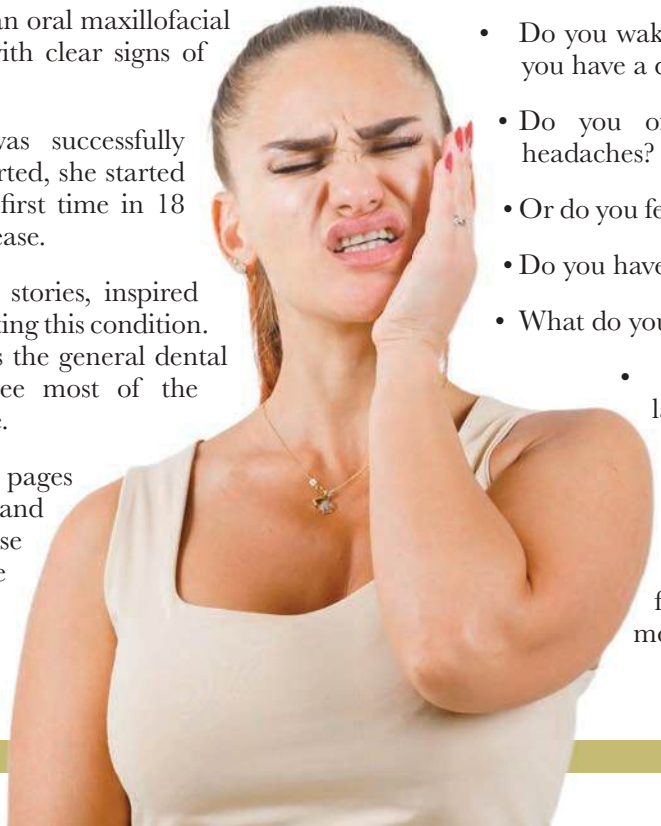
She had undergone almost all possible types of investigative examinations including many MRIs, CT scans, and X-rays.

After she had exhausted all those, she mentioned her symptoms to her dentist one day, who did not know where else to refer her to other than to an oral maxillofacial surgeon. She presented to me with clear signs of myofascial pain.

Once the cause of this was successfully diagnosed, and her treatment started, she started to feel much better and for the first time in 18 years, saw her pain begin to decrease.

This, along with many other stories, inspired this article on diagnosing and treating this condition. The main target for this article is the general dental practitioner, who happens to see most of the patients each day in their practice.

I will not claim the next few pages to be a complete diagnosis and treatment to patients with these symptoms, but I tried to condense over 5,000 patients' symptoms and pains in a few pages of easy to follow guidelines.



And the condition in question? Temporomandibular joint dysfunction.

Effective history

Let us say that a patient comes to your practice, complaining that their jaw locks. They may first have been to their general medical practitioner for headaches and other muscle pain.

If you start asking more targeted, purposeful questions, you will find more patients to help. Most patients think that going to the dentist is only for their teeth; that all the tissue in the mouth is not related to the dentist. By educating your patients you can change that and start taking care of the whole patient, not just their teeth.

Before anything taking a history is paramount. Some questions you might ask are as follows:

- Describe the pain and its pattern
- Do you wake up during the night, or do you have a disturbed sleep?
- Do you often wake up often with headaches?
- Or do you feel these more in the evening?
- Do you have shoulder or neck pain?
- What do you do - what is your job?
- Have you been stressed lately? Has there been a significant event in your life? (These can include, but are not limited to, things such as a death in the family, serious illness, redundancy, financial problems, house move, divorce, marriage.)

Physical examination

The next step is to examine the patient. Start by palpating the muscles of mastication (masseter, temporalis and intraorally the lateral pterygoid).

Ask the patient to clench the teeth and bilaterally palpate these muscles. Ask about their discomfort and maybe get them to describe how bad it is on a grade from 0-10.

The lateral pterygoid muscle pops out in the mouth around the buccal sulcus around the upper second molars once the patient starts to clench.

You only need to place gentle but firm pressure on these muscles. Most patients have their symptoms unilaterally, so will be able to tell you about the difference between the two sides.

Next, proceed to palpating the neck muscles (scaleni) around where the neck goes into the shoulder anteriorly. Also palpate the occipitalis and the trapezius.

Pain in these muscles indicates a high accumulation of lactic acid, causing pain and a tendency of self-protection (avoiding stretching) in the muscle, hence some trismus. But if you gently force the mouth to open, you will find the trismus is either a little elastic or more of a reaction from the patient tensing the muscles.

A rigid locked jaw may present itself as a mechanical obstruction as seen in disc/meniscus displacement.

Intraorally, examine any restorations; especially amalgam fillings; see if you can see polished surfaces. If an old restoration is grey at the edges and polished in the middle, or if part of the restoration is polished and part of it is grey, then these are all signs of horizontal bruxism. Remember that vertical bruxism does not show itself as readily as horizontal. Also look at attrition surfaces.

Discussing treatment

By this stage you will likely have diagnosed the patient with myofascial pain caused by bruxism.

The next stage is thus to consider what treatments you would like to offer your patient.

Some schools of thought hold that the condition is self-limiting - that if it is a new condition, it may be temporary and once the stressful situation passes, most patients experience relief of their symptoms.

Others suggest jaw exercises, which, while I have not seen any benefits from, can buy you some time. When looking at adjuvant analgesia, I have found that non-steroidal are more useful than paracetamol (with or without codeine).

I would suggest looking at prescribing a bite-raising appliance (BRA). If you diagnose myofascial pain, then a lower (more socially accepted) soft bite guard of about 2-3 mm in thickness is adequate.

Explain to the patient that the BRA will not prevent parafunction, but will hopefully work like a cushion: sitting on a hard stool is less comfortable after a few hours compared with a comfy cushioned sofa.

The patient also needs to understand that this solution is not a magic wand and that the pair will not disappear immediately. BRAs make need months to show any effect, so it is crucial to make sure the patient's expectations are realistic.

Interestingly, some studies have shown that BRAs are placebos. My personal view is that if the patient is in less pain, then you are helping them to stay socially and professionally active – placebo or not.

The patient should be reviewed at around three months, unless the BRA is uncomfortable. You don't want to see the patient three months later to be told that the BRA was digging into the gums and so was not used.

At this stage I believe you will be a hero to most of these patients.

Displaced meniscus

Another condition worth mentioning is the presence of clicking but with no pain.

In these patients you will notice that the muscles described above are not tender, but you can hear a loud click, frequently after a mouth opening of 2cm. This is the second stage of mouth opening (first 2cm are rotation,

then around 2cm translation), where the disc moves with the condyle.

A click indicates that the disc/meniscus is not in the fossa, where it should be, but more anteriorly (there is no space to go posteriorly) and once the jaw goes into the translation stage, the disc clicks back with a loud sound into the fossa.

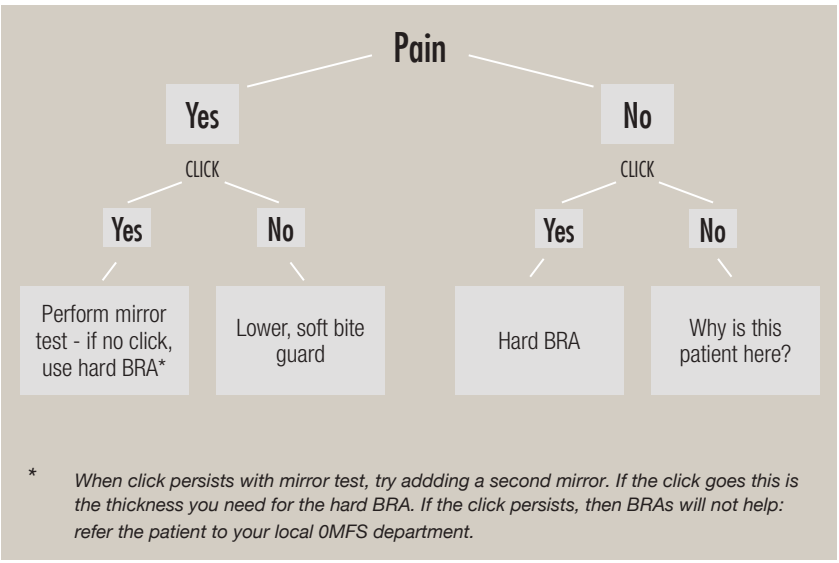
There are many aetiological causes for this, but I seem to notice a spike in young adolescent female patients.

One simple test is to perform my mirror test. Ask the patient to open the mouth as wide as he/ she can. You will hear the click (for some this may be painful). Then put a dental mirror between the posterior or anterior teeth (you can vary this to see which side gives you a better result).

Ask the patient to close slowly up to the mirror. Then ask the patient to open and close a few times no more than 2cm (Rotation). Then ask her/him to open the mouth wide. See if the click disappears.

If it does disappear, this tells you that the patient has an anteriorly displaced meniscus with spontaneous reduction. This can be a painless or a painful condition.

At this stage the space between the teeth (as with the width of the mirror) is the thickness of the BRA you will need. You may, on rare occasions, need two mirrors.



* *When click persists with mirror test, try addding a second mirror. If the click goes this is the thickness you need for the hard BRA. If the click persists, then BRAs will not help: refer the patient to your local 0MFS department.*

As you need a specific thickness to open the condylar/ fossa space, you need a hard BRA. Here you need to look into the bite of the patient and whether you want the patient to use it during the day. I find the hard BRA to be better in the upper jaw, but it can also work in the lower jaw. Here you need to take care of the following.

You need impressions of both upper and lower jaws (for both soft and hard BRAs), before you need a wax/silicone bite register. Here we need to make sure the patient does not close further than the thickness of the planned BRA, guiding the patient to stop closing before the teeth touch. Check the thickness of your bite. This will make sure that the BRA will fit well and will have occlusal contact with the teeth from the opposite jaw.

I usually ask patients to wear these for 16 hours per day and review them to make sure none of the teeth are overerupting. As long as all teeth are either covered by the BRA or are in contact with the BRA, this is not something you need to worry about.

After an initial three months, I do sometimes ask patients to wear these for 22 hours each day (remember that orthodontic aligners can be worn for this length of time with no damage to the teeth). I have seen cases of overeruption in those where the BRA did not have contact with all teeth.

If a patient attends with no pain and only with the clicking sound, you can give them this option, which may or may not reposition the disc and may be uncomfortable to wear. Leave that to the patient and let them decide: patients in pain will often do anything to reduce that pain.

Locked jaw

One other group where this may work — but may be a challenge — are patients with locked jaws. These are patients who used to have a click, but now complain of a sudden onset of trismus and disappearance of the click.

If you can take impressions and a bite (if they are still able to open to the rotation about 2cm) then you could try providing them with a hard BRA to use for a few months.

Some of these patients may benefit from more intervention like arthrocentesis and even in some cases more invasive TMJ surgery. Please refer these to your nearest oral maxillofacial surgery department. ■

About the author

Yad Zang DDS MFDS RCPS graduated in 1999 from Germany and has been based in the UK since 2001. He is a consultant in oral surgery, and has an interest in dental implants and cosmetic dentistry. He is certified in sedation for nervous patients, and has been a finalist at the Aesthetic Dentistry Awards.

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Introduction

In recent years, zirconia has undergone rapid evolutionary progress involving both the material structure and sintering technologies. The combination of new "zirconia-based" materials and new sintering technologies is very interesting because it promises to speed up production processes while maintaining high-quality levels in terms of translucency and strength. Although the study on this topic has just begun, the initial clinical and technical feedback is encouraging.

Evolution of Zirconia: From First Generation to Multilayer

The evolution of zirconia in dentistry has always pursued two objectives: improving the aesthetic qualities of the material while maintaining high mechanical qualities, and simplifying the dental manufacturing processes by reducing steps and production times of restorations.

The use of zirconia in dentistry began with 3Y-TZP, which was created for zirconia-ceramic systems as an alternative to metal-ceramic. From there, its success has grown. First-generation 3Y-TZP (Tetragonal Zirconia Polycrystalline stabilized with 3 mol% yttrium oxide) features a tetragonal structure and high mechanical performance: the presence of tetragonal grains imparts a toughening mechanism called "Phase Transformation Toughening" (PTT), which significantly increases fracture toughness (3.5–4.5 MPa•m1/2) and flexural strength (1200–1500 MPa). The mechanism is based on the ability of the tetragonal structure to counteract crack propagation through a phase transformation of the structure known as tetragonal-monoclinic (T-M) associated with volumetric expansion. The second generation of 3Y-TZP achieved a material with improved translucency, flexural strength of 900–1300 MPa, and fracture toughness of 3.5–4.5 MPa•m1/2.

Improved optical properties allowed for the creation of zirconia restorations without necessarily resorting to veneering ceramics, thus termed "full-contour" or monolithic.

The evolution of zirconia continued in 2015 with the introduction of the third generation known as 5Y-TZP with 5% mol yttrium oxide and higher sintering temperature: the result is a zirconia with a stable cubic-tetragonal microstructure characterized by a cubic phase up to 53%, also called cubic zirconia or 5Y-PSZ. The material's structure allows for high translucency: specifically, the number and

Figs. 1-3: Zirconia "Multilayer" Multichromatic 1300 MPa, sintering temperature 1550°C, Microwave process in 4.00 hours.

size of the crystals, larger than those of 3Y-TZP, favor light transmission, reducing refraction effects and providing better translucency. However, an increase in the number of cubic crystals influences the crack propagation pattern, reducing flexural strength (400–900 MPa) and fracture toughness (2.2 to 2.7 MPa•m1/2).

To overcome the mechanical limitations of 5Y-PSZ, the fourth generation of zirconia was introduced in 2017, characterized by a 4% mol yttrium oxide content (4 mol% Y2O3 0.05% Al2O3), known in the literature as 4Y-TZP or 4Y-PSZ. In this case, the cubic phase represents about 25% of the structure, providing moderate translucency (30% translucency) but improved flexural strength (600–1000 MPa) and fracture toughness (2.5 to 3.5 MPa•m1/2) compared to 5Y-PSZ and better aging resistance than 3Y-TZP.

To mimic the color and translucency of natural teeth following the biomimetic principle, recent years have seen the introduction of various zirconia-based materials commercially termed "multilayer."

The first types of zirconia under the "multilayer" name are 3Y-TZP multilayer multichromatic and 5Y-PSZ multilayer multichromatic: they are defined as multichromatic because they are pre-pigmented in layers, while having uniform yttrium content and phase composition. With this material, the color gradient of the monolithic restoration determines a succession of chromatic shades between the cervical and incisal portions of the restoration to imitate the natural tooth. The compositions of the pigments represent the only difference between the layers, leading to significant differences in hue but not in translucency and strength of the layers. Multichromatic multilayer zirconia has also been proposed in the 4Y-PSZ version after a few years.

In 2016, the most evolved and interesting zirconia-based material to date was introduced, namely multilayer zirconia with hybrid composition, representing the "multilayer" zirconia properly called. This zirconia is also multichromatic but with variable yttria content and phase composition: this results in a monolithic restoration where two materials (3Y-TZP and 5Y-PSZ) with different mechanical and translucency characteristics coexist, which we can define as multiresistant and multitraslucent.

Following the introduction of 4Y-PSZ, more sophisticated multilayer zirconia compositions have been introduced on the market since 2019. In monolithic restorations with multilayer hybrid composition zirconia, the incisal/occlusal area features zirconia with higher translucency, while high-strength zirconia is used for the cervical area. From a microstructural point of view, there is a gradient of yttrium oxide content from gingival to incisal regions, with a progressive increase in the cubic phase content and thus translucency. For proper selection of zirconia in such a heterogeneous market context, a recent review classifies the new generations of zirconia, which are erroneously referred to with the generic and misleading term "multilayer," into multichromatic zirconia (pre-pigmented in layers but with uniform crystalline structure) and multilayer zirconia (characterized by a hybrid crystalline structure).

Microwave Sintering Technology

The sintering parameters of zirconia (time and sintering temperature) influence the microstructure, grain size, and mechanical and optical properties of zirconia. Specifically, prolonged hold times of conventional sintering and high temperatures can induce an undesirable T-M phase transformation of the microstructure (from Tetragonal to Monoclinic phase) in zirconia, leading to increased grain size, reduced mechanical properties, and altered optical properties. Additionally, the long times required for conventional sintering procedures preclude the delivery of restorations in short times.

To make pre-sintered zirconia available "chairside," recently developed sintering protocols called "speed" (60-120 minutes) and "high-speed" (10 minutes) have been developed using more advanced induction furnaces. However, these technologies are currently dedicated to single or small dental restorations and are not yet indicated for highly complex structures. Moreover, there is a lack of data on the sintering parameters dedicated to the latest generation materials. A promising alternative to conventional sintering technologies is microwave sintering technology (Microwave, MW). "Microwave" is a well-known sintering technology in the field of building ceramics and other industrial fields but is little known in the field of dental ceramics. Recently, high-performance machines have been developed for sintering zirconia in dental technology, applicable to all types of prosthetics, from the simplest to the most complex.

In this regard, we present a series of monolithic zirconia prosthetics of increasing complexity (Figs. 1 to 39): the restorations were made of the latest generation of

Fig. 4

Fig. 5

Figs. 4-5: Zirconia "Multilayer" Multichromatic 900 MPa, sintering temperature 1500°C, Microwave process in 3.40 hours.

Fig. 6

Fig. 7

Fig. 8

Fig. 9

Figs. 6-9: Zirconia "Multilayer" Multichromatic 600 MPa, sintering temperature 1500°C, Microwave process in 3.20 hours.

Fig. 10

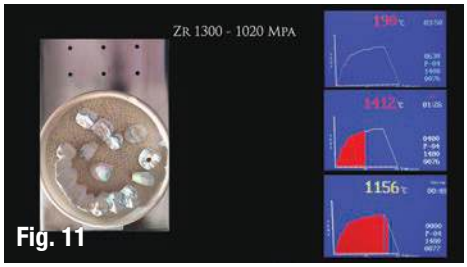

Fig. 11

Fig. 12

Figs. 10-12: Zirconia "Multilayer" Multichromatic 900 MPa, sintering temperature 1550°C, Microwave process in 2.30 hours.

Fig. 13

Fig. 14

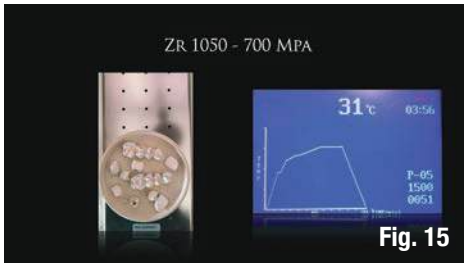

Fig. 15

Fig. 16

Figs. 13-16: Zirconia "Multilayer" Multichromatic 600 MPa, sintering temperature 1500°C, Microwave process in 3.20 hours.

multichromatic and multilayer zirconia and sintered with "Concord 4.0" microwave technology. The volumetric nature of microwave heating offers several advantages: uniform heat distribution, reduced thermal stress, shorter sintering times, uniform and better-controlled microstructure, high material density, high surface quality, mechanical properties of the material comparable to conventional sintering, optical properties comparable to conventional sintering, reduced energy and processing costs.

Currently, this technology still has partial data on sintering protocols that require further studies on the latest generation materials. However, preliminary data are promising and suggest that this technology may represent a credible alternative to conventional technologies for the production of prosthetic and implant-prosthetic restorations.

Conclusion

The evolutionary path of zirconia focuses on the microstructural characteristics of the material and sintering technologies. Multilayer zirconia involves the association of different generations of zirconia within the same material and seems to represent a very promising compromise in terms of optical and mechanical properties. Although multilayer systems propose a synthesis of the advantages of different types of zirconia, further studies are needed to investigate potential criticalities regarding material resistance and susceptibility to aging phenomena. Moreover, the recent market introduction of these materials makes medium- and long-term performance data unavailable.

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Fig. 17

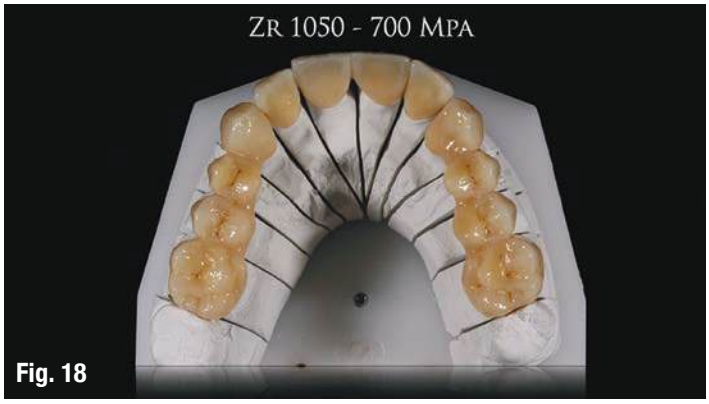

Fig. 18

Figs. 17 - 18: Zirconia "Multilayer" Multichromatic 900 MPa, sintering temperature 1550°C, Microwave process in 2.30 hours.

Fig. 19

Fig. 20

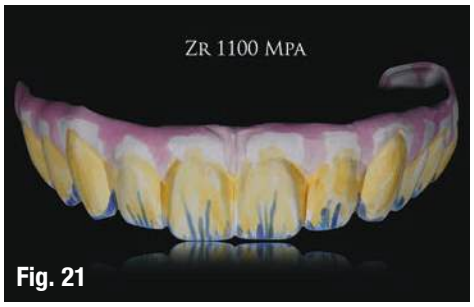

Fig. 21

Figs. 19 - 21: Zirconia "Multilayer" Multichromatic 1300 MPa, sintering temperature 1550°C, Microwave process in 4.00 hours.

Fig. 22


Fig. 23

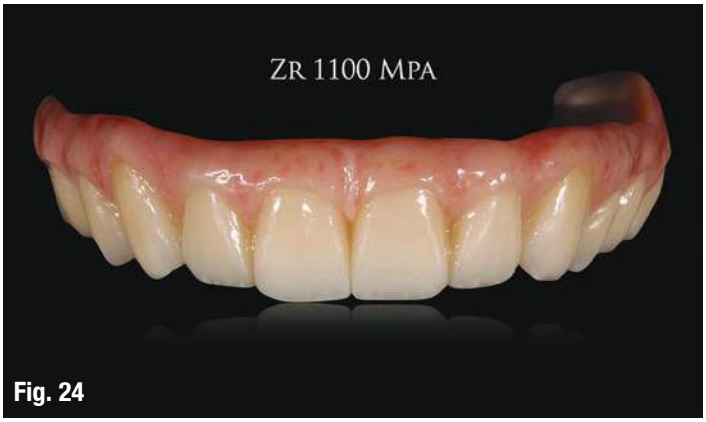

Fig. 24

Fig. 25

Figs. 22 - 25: Zirconia "Multilayer" Multichromatic 900 MPa, sintering temperature 1550°C, Microwave process in 2.30 hours.

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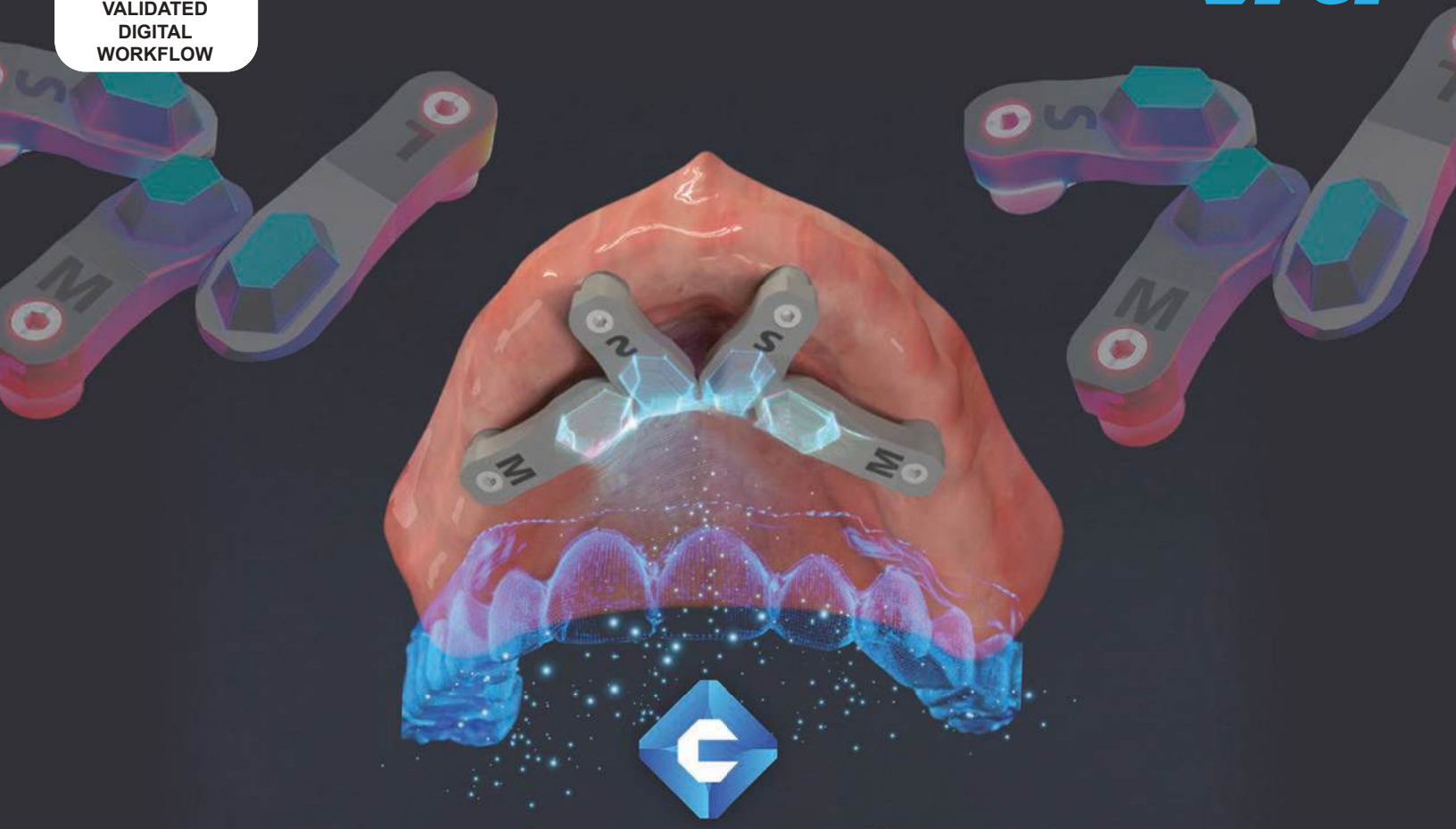

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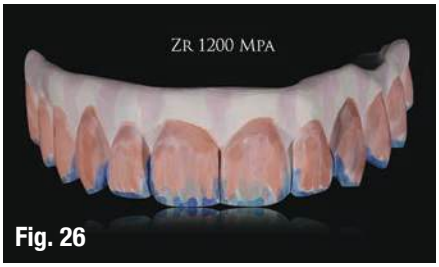
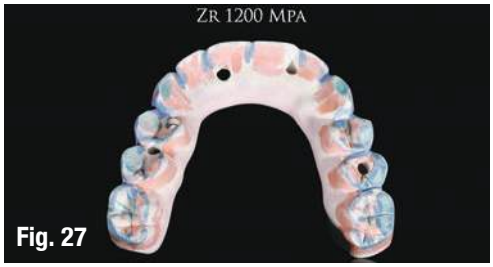
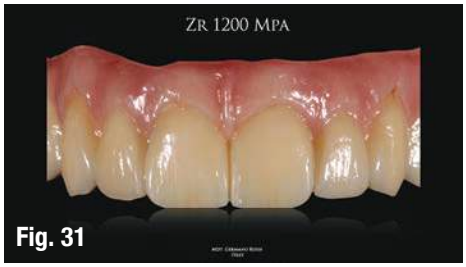
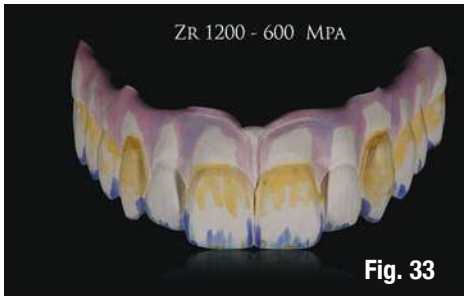




Figs. 26 - 28: Zirconia "Multilayer" Multichromatic 600 MPa, sintering temperature 1500°C, Microwave process in 3.20 hours.



Figs. 29 - 31: Zirconia "Multilayer" Multichromatic 600 MPa, sintering temperature 1500°C, Microwave process in 3.20 hours.



Figs. 32 - 34: Zirconia "Multilayer" Multichromatic 1300 MPa, sintering temperature 1550°C, Microwave process in 4.00 hours.

Figs. 35 - 37: Zirconia "Multilayer" Multichromatic 1300 MPa, sintering temperature 1550°C, Microwave process in 4.00 hours.

Figs. 38 - 39: Zirconia "Multilayer" Multichromatic 600 MPa, sintering temperature 1500°C, Microwave process in 3.20 hours.

Microwave sintering technology promises to revolutionize zirconia sintering due to the volumetric nature of heating, which, unlike conventional technologies, allows uniform heat distribution. The current challenge is to combine the efficiency of new "microwave" sintering technologies with new "multilayer" materials. ■

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NOVEMBER 8TH, 2025:

3D Printing in the Dental practice – Current Applications

This course is for Dentists Level : Basic - Intermediate

Course Description:
I will present an overview of Dental 3D printing including materials, printers, types of appliances and workflows..

Course Objectives:
Upon Completion of this course, the participant should understand the current applications for 3D printing in dentistry and specifically in a clinical dental practice.

3D printing is set to revolutionize how we practice dentistry. We will discuss the variety of dental applications including surgical guides, Bite splints and nightguards, prototypes, permanent restoration such as inlays, onlays and crowns, dentures etc

Course Outline:

- Types of 3D printers including pricing and applications for each
- Hands on Surgical Guides printing
- Hands on Denture printing
- Hands on Temporary restoration printing
- Proper printer hygiene
- Hands on staining exercise

Dr. Rick Ferguson has been involved in teaching implant dentistry for the last 32 years and has lectured in every major city in the United States and internationally in many countries. He has placed and restored over 10,000 dental implants and maintains a private practice with his wife Dr. Katherine Ferguson in Davie, FL emphasizing dental implants as well as a home in Vancouver BC . They also teach a live surgery course and have been attended by thousands of dentists. More recently he has been a pioneer in developing 3D printing techniques for dentistry.

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How to Reline 3D Printed Dentures with PacDent's Rodin Soft Reline Kit:

A Step-by-Step Guide

Byron Park

SCAN ME

Introduction to Digital Dentures

I had the opportunity to try out the Rodin Soft Reline Kit, and here is my experience. Relining 3D-printed dentures can be problematic, especially when compared to traditional acrylic dentures.

This article highlights the entire workflow using the Rodin Soft Reline Kit, which we found to be a useful tool in the cupboard if you are a dentist or clinical dental technician delivering or fabricating 3D-printed dentures.

Advantages of Digital Dentures

There are several key advantages to 3D printed dentures and digital dentures:

- The fabrication process is very streamlined.
- It can be done with an entirely digital workflow from either intraoral scans or conventional impressions scanned with a desktop scanner in the lab.
- The design of digital dentures can be rapidly completed with dental design software offered by companies such as 3Shape.
- The dentures can be manufactured very quickly by utilizing 3D printing or milling.
- In the event of the patient losing or breaking the denture, a digital denture can immediately be remanufactured.
- Digital denture can be prototyped quickly with 3D printed try in resins.
- Small changes can easily be made to the denture on the design software.
- If the first denture is a transitional denture, the tooth set up of the denture can also be reused for the final denture or implant bridge. This gives more consistency to the treatment provided to the patient.

3D Printing vs. Milling Dentures

The denture-designed files can either be printed or milled.

Speed and Cost Comparison

Printing is faster and more economical than milling:

- 3D printing dentures can be completed within 1 hour.
- Material costs of the resin are around $30-50 USD in total
- Milling dentures using Ivoclar Ivotion discs can be completed within 4 hours. Materials costs of the discs is around $200-250 USD.
- The cost of a 3D printer is considerably less than a milling machine capable of milling dentures.

Dr. Byron Park's Preference

So, which one is my preference?

I really love the speed of 3D-printed dentures. They are great for immediate or transitional dentures. The accuracy and fit are excellent. However, the monolithic appearance of the resins makes the aesthetics typically worse than those of multilayered PMMA materials.

I prefer the appearance of milled dentures, which are more akin to traditional heat cured acrylic dentures. The proven track record of PMMA and its longevity guides me towards using milled dentures as my final prosthetic. Typically in an immediate denture case, we will provide 3D printed dentures as the immediate dentures.

Conventionally, dentures are relined typically after 3-6 months. If we have printed the first denture using a digital workflow instead, we provide our patients with a new set of milled PMMA dentures when it is time to reline.

Regardless of 3D printed or milled dentures, the first denture set up can be reused with the base adapted to the healed shape of the edentuluous arches. This is done by using the first dentures to take reline impressions. The dentures are then scanned chariside or in the lab using a desktop scanner. The original tooth set up can easily be replicated or tweaked and the denture base made to fit the new shape of the jaws.

Case Study: Immediate Dentures for a Periodontal Patient

My patient came for a dental visit, accompanied by family. They had a history of extreme dental anxiety and was very embarrassed about the state of their teeth. They didn't do any oral hygiene or toothbrushing and had a history of smoking and vaping.

Their last dental visit was 5 years ago to get two lower incisors removed as they were very loose. They had wisdom teeth and other molars removed due to periodontal disease.

On examination radiographic bone loss was extending to the middle third and beyond for most of their teeth with almost no periodontal bone around the lower anterior teeth.

Fig. 1 — 3D Printed Denture (unpolished and uncharacterised

Fig. 3

Fig. 2 — Milled Ivotion Denture (unpolished)

Fig. 4

Diagnosis and Treatment Plan

My diagnosis was Periodontal Disease, Stage IV, Grade B.

We discussed periodontal treatment options. Ultimately, the patient and family elected to have immediate dentures.

Fabrication of Immediate Dentures

Dental technician Mark Gutierrez at iDD lab designed immediate dentures using 3Shape Dental System denture module.

The dentures were 3D printed using Nextdent 5100 printer. The teeth were printed with NextDent C&B MFH N1 resin and the bases were printed with Nextdent Denture 3D+ Classic Pink.

The lab finished the dentures in 48 hours after receiving the impressions.

This is the power of digital dentures. The design can be done quickly and the manufacturing process of 3D printing allows for rapid fabrication.

The patient's teeth were removed under IV sedation and the dentures immediately inserted. The patient and family were very emotional when they saw their new smile.

The Importance of Soft Reline and Where the Rodin Kit fits in.

Why Soft Reline?

I typically wait 3-6 months after delivering the immediate denture before proceeding with the final dentures. This allows the remodeling and shrinkage of the edentulous ridges.

Sometimes in this 6 month wait, the first set of dentures can become very loose. In this case, my patient had been using denture adhesive paste and was still struggling with the looseness of the dentures.

Soft reline is not a permanent reline but can help to temporarily improve the fit of the dentures. As well as provide relief if the patient is struggling with adapting to the hard resin or acrylic base rubbing on their gingiva.

Introducing the Rodin Soft Reline Kit

I was very happy to discover this product by Rodin as it is specifically formulated to bond to 3D printed resins. Traditional acrylic reline materials may not bond to 3D printed dentures. It is a silicon based material that is very smooth and feels comfortable to the patient.

A Closer Look at the Rodin Soft Reline Kit

So what's included in the Rodin Soft Reline Kit:

- Adhesive Primer to bond to the 3D printed resin
- 6 x Applicator swabs to apply the primer.

Fig. 5

Fig. 6

- Cartridge of soft reline material that fits in a normal impression dispensing gun
- 6 x wide mouth dispensing tips
- Brown Scotch-Brite wheel to roughen the intaglio surface of the denture
- Tapered Cone Finishing Stone

Additional Required Materials

What is required but not included is a straight handpiece or lab handpiece. You will also need an acrylic bur to bevel the borders of the denture.

Not included is an optional bottle of VPS release used to easily remove the soft reline material.

Step-by-Step Guide to Using the Rodin Soft Reline Kit

There are clear instructions included with the kit. I booked a 30 minute appointment for upper and lower soft reline.

Preparation

First make sure the dentures are clean. I made sure to wipe off any denture adhesive

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Fig. 7


Fig. 8

Bevel the borders of the dentures to create room for the reline material to wrap around. Brown Scotch-Brite wheel used to roughen the intaglio surface to improve bonding of the reline.


Fig. 9


Fig. 10

Application Process

Adhesive Primer applied using applicator swab and allowed to dry for 2 minutes.


Fig. 11


Fig. 12

Even coat of soft reline material dispensed over intaglio surface. 5 minute intraoral setting time.


Fig. 13


Fig. 14

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Fig. 15

Finishing Touches

Excess can be trimmed from borders with scalpel blade and a finishing stone can also be used to trim material as well.

I did one denture at a time and after inserting the denture in, the patient and I did border moulding movements with the lip and tongue to adapt the material functionally.

I guided the patient into the correct occlusion against the opposing denture and hold it there to avoid creating an uneven occlusal cant.

Results and Patient Feedback

My patient immediately noticed a difference.

The upper denture retention was greatly improved and they didn't need to use denture adhesive. The dentures had a more intimate fit to the tissues and felt more comfortable to wear.

Final Thoughts and Recommendations

3D printing and printed resin dentures are becoming more common in dental offices and labs. It is important to have high quality materials that are compatible for use with 3D printed dentures.

I found the Rodin Soft Reline Kit to be very intuitive, easy and fast to use for chairside soft reline. I would recommend this kit to dentists or clinical dental technicians who deliver or fabricate 3D printed dentures. ■

About the author

Dr. Byron Park is a general dentist in full time private practice in Wellington, New Zealand, combining 10 years of experience in general dentistry and a passion for digital dentistry. He has been part of Naenae Dental Clinic and the iDD team since 2019. Byron has received training in the latest digital dentistry tools such as dynamic navigated dental implant surgery, jaw motion capture and artificial intelligence in diagnosis of dental radiographs. He routinely uses the latest digital dentistry technology to offer his patients the highest standard of cutting edge dental care.

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Materials Science Basics - Explained Simply

Foundations of CAD/CAM materials

An excerpt from the book "3D Printing & CAD/CAM in Digital Dentistry" by **Josef Schweiger, MSc.**

Developments in the field of innovative materials suggest the expansion of existing manufacturing methods and new treatment concepts. Based on the wide range of materials available, they can first be classified according to the manufacturing method. In additive manufacturing, the object is built up layer by layer. Materials currently used include plastic and resin (stereolithography) or metals (selective laser melting). The subtractive approach creates the object by removing material. Materials used include feldspar ceramics, glass ceramics, zirconium oxides, plastics, or metals.

A classification of material families for dental CAD/CAM milling machines can be made as follows:

- Metallic materials (e.g., CoCr alloys, titanium)
- Polymer materials (e.g., PMMA, composite)
- Ceramic materials (e.g., feldspar ceramic, zirconia)

These three material "families" can in turn be assigned to various subgroups. A detailed breakdown can be found in Chapter 4.2. The list of materials for CAD/CAM processing depends on the manufacturing system. Some milling machines are specifically designed for producing zirconia frameworks, while others cover the entire range of materials from metals to plastics to glass ceramics and oxide high-performance ceramics.

Materials Science Basics

Flexural Strength

Flexural strength is one of the most important values for assessing the strength and dimensioning of an object. It describes the applied force that an object can withstand before fracture occurs due to crack formation. Flexural strength thus defines the limit of maximum elastic load-bearing capacity.

The different behavior of ceramics compared to metals is based on the atomic bonding structure. In ceramic materials, due to covalent-ionic bonds, plastic deformations are not possible. Ceramic materials break spontaneously when the elastic limit is exceeded, whereas metals undergo plastic deformation. In general, the flexural strength of ceramic materials can be compared to the 0.2% offset yield strength of metallic materials. The 0.2% offset yield strength is used instead of the difficult-to-determine flow or yield strength. The 3- and 4-point bending tests are used for determination. The biaxial bending test (piston on three balls) is used by the Full Ceramic Working Group of the Department of Prosthetic Dentistry at the LMU Munich as the standard test for determining the flexural strengths of high-performance ceramics such as zirconia. The test setup is recognizable from the schematic representation (Fig. 1a to c).

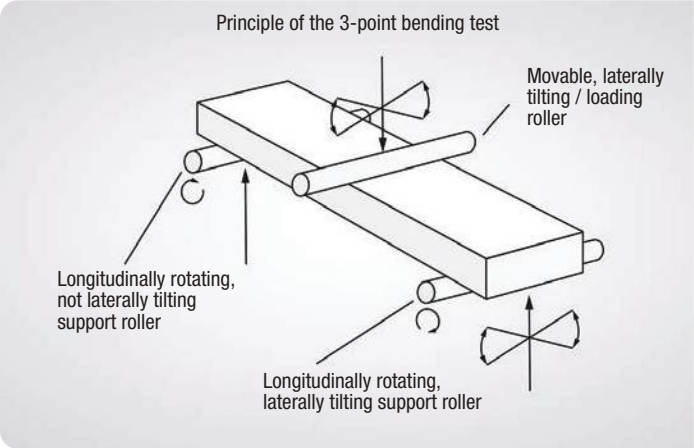
Example Flexural Strength/0.2% Offset Yield Strength:

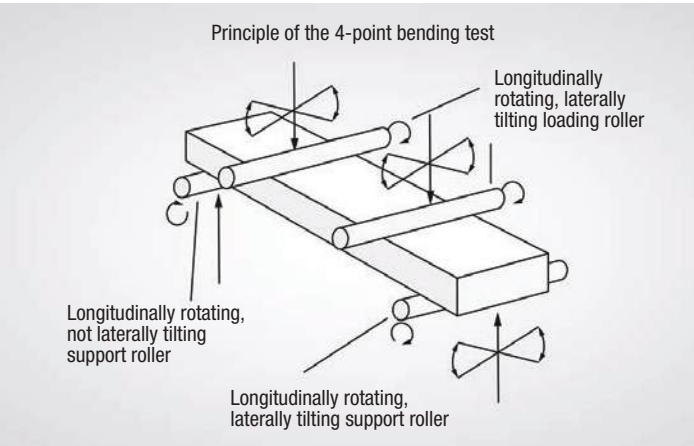
- Glass ceramic: 60 to 120 MPa (Special position lithium disilicate with approximately 360 MPa)
- Cobalt-chromium alloy: 600 to 1,000 MPa (For metals, the 0.2% offset yield strength is comparable to the flexural strength for ceramics)

Hardness

Hardness is the mechanical resistance that a material opposes to the mechanical penetration of another body. Various types of hardness can be distinguished, and especially the hardness test methods differ. For example, hardness tests can distinguish between Martens hardness (HM), Rockwell hardness (HR), Brinell hardness (HB), Vickers hardness (HV), Shore hardness, or Mohs hardness.

The individual hardnesses differ due to the different test methods or ordinal scales. Two hardness test methods are briefly described below.





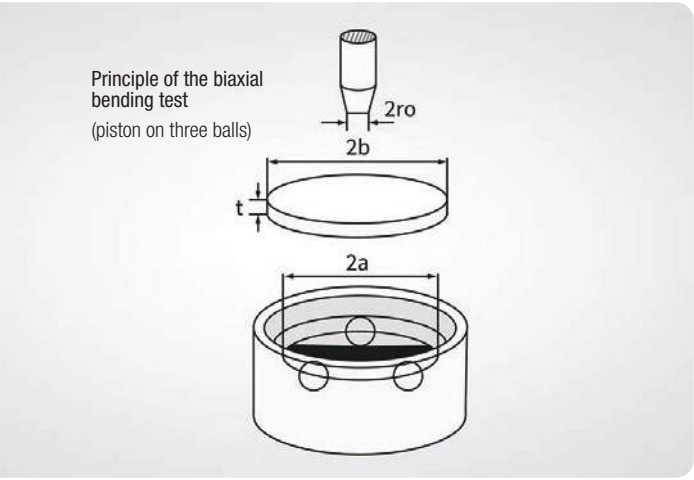


Fig. 01a-c: The three different principles for determining flexural strength (Image source: Full Ceramic Working Group of the Department of Prosthetic Dentistry at the LMU Munich)

Brinell Hardness (HB)

In the Brinell hardness test, a ball made of hardened steel or hard metal is pressed with a certain force and for a certain period into the flat surface of the material to be tested. The balls can have a diameter of 2.5 mm, 5 mm, or 10 mm. The load and the ball diameter must be adjusted so that the diameter of the ball impression (= d) is 1/5 to 1/2 of the ball diameter. The diameter d of the ball impression is measured, and the area of the impression is calculated. The Brinell hardness number is obtained by dividing the applied pressure by the area of the impression (Fig. 2).

Vickers Hardness (HV)

The Vickers hardness test, in particular, is used for dental technical metals. A diamond pyramid with an opening angle of 136° is used as the indentation tool under a specified test force. The indentation surface is measured. The ratio of test force (in Newton) to indentation surface (in mm²), multiplied by the factor 0.1891, yields the Vickers hardness.

HV 10 means that the test force is 10 kiloponds. Thus, HV 5 means that a test force of 5 kiloponds was applied. For dental alloys, HV 5 is generally used (Fig. 3).

Example Vickers Hardness:

The precious metal alloy Degulor M (Dentsply Sirona) has a maximum hardness of HV 5 = 235 after casting and slow cooling (= self-annealing).

Elastic Modulus

This material characteristic determines the relationship between stress and strain during the deformation of a body with linear elastic behavior. Accordingly, the elastic modulus defines the maximum resistance to deformation.

Example Elastic Modulus:

- Glass ceramic: 60 to 80 GPa
- Zirconia: 200 to 220 GPa
- Non-precious metal alloys: 180 to 230 GPa

Coefficient of Thermal Expansion (CTE)

The coefficient of thermal expansion (CTE) describes the temperature-dependent dimensional change of a material. A CTE of 13.5 means that the material expands by 13.5 x 10^-6 of the original length when heated by 1 Kelvin. The CTE is given significant consideration, among other things, in the combination of different materials, for example, in the ceramic veneering of a framework.

In some all-ceramic systems, similar to metal-ceramics, the idea is pursued that the stronger framework ceramic, due to a slightly (up to 10%) higher CTE, compresses the weaker veneering ceramic during the cooling phase. This principle should not be overstrained and requires that the framework ceramic, which is under tensile stress, be sufficiently strong and geometrically voluminous. Example Coefficients of Thermal Expansion (X 10^-6/K):

- Zirconia: approximately 10.5
- Metal-veneer ceramics: 11.5 to 13.8

Fracture Toughness

Fracture toughness refers to the maximum mechanical stress that a material can withstand without breaking and is not equivalent to flexural strength. Flexural strength is determined as pressure [MPa] and serves to specifically characterize materials. Fracture toughness is defined as the force [N] that leads to the failure of test specimens. The measurement is

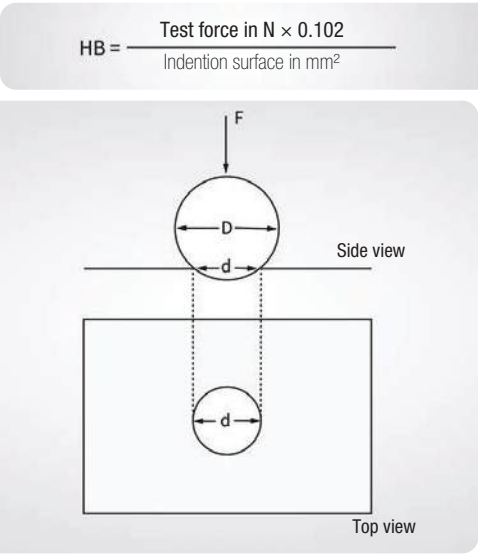


Fig. 02: Principle of hardness determination according to Brinell (Image source: Knischewski F, Rau G: Basic Knowledge for Dental Technicians - Metals. Verlag Neuer Merkur 1981; ISBN 392128001x)

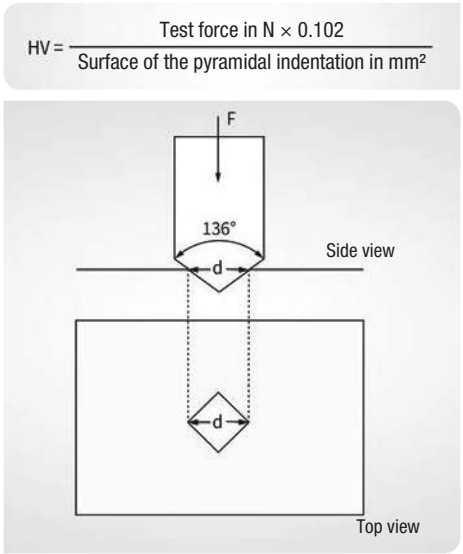


Fig. 03: Principle of hardness determination according to Vickers (Image source: Knischewski F, Rau G: Basic Knowledge for Dental Technicians - Metals. Verlag Neuer Merkur 1981; ISBN 392128001x)

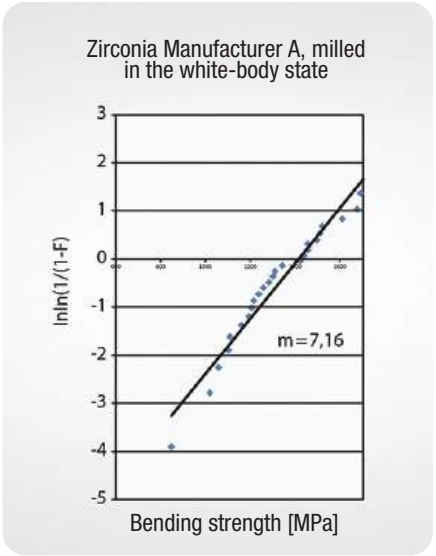


Fig. 04: Representation of the scatter of strengths of a white-bodied milled zirconia with the Weibull distribution. The Weibull parameter m is a measure of the scatter of strength values. The higher m is, the more reliable the prediction becomes.

made on component-like test specimens. Fracture toughness values are generally only for orientation.

The chewing load in the molar region is given with values from 200 to 900 N. According to Schwickerath et al., a distance from the mean maximum chewing force in the molar region of 300 N with a factor of 2 to 2.5 should be maintained. From this, a minimum fracture toughness of 600 N can be inferred.

Weibull Modulus

The Weibull modulus is a measure of the homogeneity of the distribution of flaws and thus an important indicator of the reliability of a material (Fig. 4). In principle, the strength of a material (for example, ceramic) is asymmetric due to an uneven distribution of microstructural homogeneities. With Weibull analysis, the scatter behavior of strength within the material is determined. The Weibull modulus is thus an important characteristic for material manufacturing because the scatter of strength depends on surface and microstructure quality. Factors influencing this include raw materials, their grain size, and the manufacturing process. The Weibull modulus is based on the "weakest link" concept of failure and also incorporates manufacturing parameters. For example, two zirconia materials may have different Weibull values because they were manufactured using different methods.

Example Weibull Modulus:

- Industrially manufactured oxide ceramics (CAD/CAM): approximately 20
- Ceramics fabricated by dental technicians: 5 to 15

Fracture Toughness

(critical stress intensity factor)

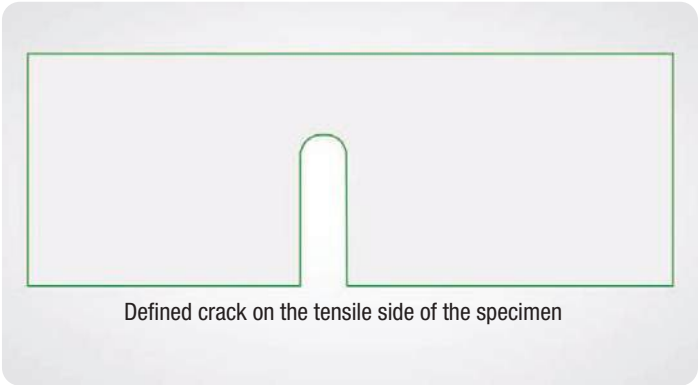


Fig. 05: Fracture toughness

Fracture toughness is the ability of a material to resist the propagation of cracks. The slower a crack propagates, the greater the long-term strength. Thus, the value of fracture toughness determines the resistance that a material opposes to the propagation of a crack, depending on stress and crack length. The stress intensity factor KIC defines the limit at which crack growth cannot be stopped by relief and is the resistance that the material opposes to the propagation of a crack (Fig. 5). This property is particularly well pronounced in metals (between 60 and 120 MPa). The fracture toughness of ceramics is much lower.

Example Fracture Toughness (KIC) in MPa:

- Dental alloy: 60 to 100
- Zirconia: 7 to 10
- Lithium disilicate: 3 to 6
- Simple dental ceramics: approximately 1 ■

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