

Oral Health Quality of Life: A Modern, Patient-Centered Dental Approach*

With Professor Avi Banerjee, Professor of Cariology & Operative Dentistry at King's College London

It is well known today that oral health status can have a significant impact on the overall physical, mental, emotional and social health of the patient. Oral health quality of life (OHQoL) seeks to measure this impact and optimize these different facets of health and wellbeing, aligning with the modern shift towards holistic, patient-centered care. In this article, Professor Avi Banerjee, Professor of Cariology & Operative Dentistry at King's College London, explores how Biodentine® can be used to deliver OHQoL and contribute to the goal of improved health and wellbeing in every area of a patient's life.

Why Oral Health Quality of Life Is a Priority in Modern Dentistry

Oral health can be described as freedom from dental pain and disease, the ability to perform daily functions, and comfort with one's oral self-perception and appearance. OHQoL recognizes that the impact of oral health extends far beyond the mouth, focusing on how it affects the whole person.

- **Physical/systemic health:** The chronic inflammation associated with periodontal disease has been linked to cardiovascular disease, diabetes, rheumatoid arthritis and Alzheimer's disease.^{1,2} Those with any symptoms of gum disease were recently found to have a 15% higher chance of having multiple chronic conditions.³
- **Mental health and emotional wellbeing:** Pain or loss of oral function (e.g. edentulism) can cause anxiety, distress and low mood. Further, a negative self-perception of the teeth or smile can lead to self-consciousness and social isolation.
- **Development:** Poor oral health has a notable impact on a child's social, speech and language development, which can in turn lead to poorer reading ability and academic achievement.⁴ Early childhood caries is also associated with high absenteeism in school-aged children, exacerbating these effects.⁴ The impact continues throughout the child's life, increasing the risk of poor adolescent mental health and adult unemployment.⁴
- **Economic health:** The direct cost of dental treatment can be prohibitive, particularly in countries without publicly funded dental care, and risks pushing economically insecure families into financial hardship.⁵ Indirect costs include

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work absenteeism, lost productivity, and even reduced employment opportunities due to the appearance of the mouth.^{5,6}

Prof. Banerjee acknowledges that the dental profession has not always excelled at treating the whole person:

*“We’ve got a huge amount of evidence to show the impact that oral health has on pretty much every physiological system in the body. But when we look at how oral health is managed around the world, our teams are completely detached from the wider healthcare systems. As oral healthcare practitioners – and I don’t even call it dentistry now, it’s oral healthcare -- we can’t **just** focus on teeth. We have to focus on the person, their general health, their mental health and their overall wellbeing. I think this is critical if we want to deliver real oral health quality of life.”*

Delivering OHQoL with Minimum Intervention Oral Care

One way Prof. Banerjee centers OHQoL in his practice is through the use of the Minimum Intervention Oral Care (MIOC) framework. He describes it as “*a person-focused, prevention-based, risk/susceptibility-related framework delivered by the whole team,*” consisting of four interlinked domains.

- **Domain 1: Diagnosis and detection.** This domain focuses on proactive risk assessment and early detection. The earlier disease is detected, the less intervention the patient typically requires to restore oral health and function.
- **Domain 2: Prevention and control.** The second domain focuses on working with the patient to push behavior change and stop the development or progression of disease.
- **Domain 3: Minimally invasive operative dentistry.** When patients do present with more advanced, symptomatic dental disease, the MIOC approach prioritizes minimally invasive interventions like vital pulp therapy.
- **Domain 4: Recall and maintenance.** The final domain is, in Prof. Banerjee’s opinion, the most important. Here, he eschews the passive monitoring approach, bringing patients back for active surveillance and management.

How does Biodentine® fit into this framework?

By the time the patient reaches the third domain, their OHQoL may be significantly affected by discomfort, pain, functional difficulties and/or aesthetic concerns. The choice of material used in minimally invasive interventions can play an important role in the success of the treatment and the extent to which OHQoL is restored. The ideal material must have the following qualities, all of which Prof. Banerjee believes are exemplified by Biodentine®.

1. Bioactive properties to promote biological healing and repair

Prof. Banerjee describes Biodentine® as “a very clever bioactive material” that leverages the natural reparative capabilities of the tooth. He says:

“Biodentine® doesn’t just fill a gap – it actually puts biology to work in the tooth, helping us to retain teeth longer and improve quality of life.”

Combining pulp therapeutic and restorative properties in a single product, Biodentine® stimulates angiogenesis and growth factor release to promote biological healing and preserve pulp vitality.^{7,8} When placed in contact with affected dentine, it promotes remineralisation⁷⁻¹⁰ through the formation of reactionary dentine and dentine bridges.¹¹ This helps restore the structural integrity and function of the tooth..

In deep caries restoration, Biodentine® has been shown to be capable of remineralizing not just caries-affected dentine: in vitro evidence⁹ also suggests its ability to induce mineral deposition on caries-infected dentine. This offers practitioners the ability to preserve the natural tooth structure and restore OHQoL even in more advanced cases of caries.

2. Biocompatibility with the tissues to prevent inflammation, pain and cytotoxicity

Made using patented Active Biosilicate (ABS) Technology™, Biodentine® is completely free from the heavy metals and other contaminants.^{9,10,12,13} The ultra-pure material has no cytotoxic, mutagenic, sensitizing, irritant or inflammatory effects on the pulp⁷, making it suitable for use even when the pulp is exposed.⁷ The evidence from clinical studies supports a pain-relieving effect for Biodentine™ in asymptomatic and symptomatic pulpitis¹⁴, leading to greater patient comfort, faster recovery and improved overall OHQoL.

3. Antimicrobial properties¹⁴⁻¹⁸ ** to prevent infection

In deep caries restorations, residual bacteria can present a significant risk of reinfection, treatment failure and post-operative pain. This is especially true where selective caries removal has been used, as this technique intentionally leaves behind a small amount of caries-affected dentine to avoid pulp exposure. With its high pH, Biodentine® creates an alkaline environment which inhibits the growth of microorganisms^{14,15}, protecting the pulp from further infection and reducing the risk of inflammation.

4. The strength to restore the function of the natural tooth

Biodentine® is the first and only material that can replace dentine from the pulp to the crown of the tooth, with compressive strength and hardness comparable to that of natural dentine.^{7,15} Teeth treated with Biodentine® show excellent long-term resistance

^{**} Antibacterial properties documented in scientific literature.

to fracture, with some teeth remaining intact with vital pulp as long as 8-12 years after treatment.¹⁹

By replicating the strength of the natural tooth, Biodentine® can help to fully restore its function and resistance to occlusal forces and improve OHQoL markers. And thanks to its durability, Biodentine® can help preserve patients' long term functional dentition.

5. Durability and stability to maintain results long-term

Strength is not the only factor that affects the longevity of a restoration; seal quality and dimensional stability are also key to long-term success. Biodentine® bonds tightly to the dentine surface via micromechanical anchorage, creating a strong hermetic seal that is highly resistant to microleakage.^{7,15,20,21}

Maximizing the success of the MIOC framework

It is clear that Biodentine® is a powerful ally in the delivery of the MIOC framework. Indeed, when used for indirect pulp capping of deep caries lesions, Biodentine® shows excellent success rates in both primary and permanent teeth with reported success rates up to 99.24% in primary teeth after 3-12 months²² and 95.83% in young permanent molars²³ after six months of follow-up.:

“Biodentine® does a wonderful job in terms of encouraging biological healing and restoring form, function and aesthetics. But Biodentine® can’t do the heavy lifting on its own. It’s a critical ingredient, but it performs best in conjunction with prevention, behavior change, and various other strategies to drive oral health quality of life.”

Here is Prof. Banerjee's advice for maximizing the success of the MIOC framework.

Tailor treatment to the individual

Prof. Banerjee urges practitioners to go beyond protocols and SOPs. He says:

“Care must be personalized. When you’re simply working through a protocol, you forget that each person is different. It’s ok to follow a procedure, but you must be tailoring each step to the individual in front of you – their wishes, their capabilities, their family and cultural context...”

In doing so, practitioners can ensure that the treatment not only restores the tooth but also meets the patient's practical and aesthetic needs, improving the aspects of OHQoL that matter to them most.

Empower the patient

Prof. Banerjee believes that in order to deliver lasting OHQoL, practitioners must empower the patient to take ownership of their oral health. He says:

“The patient has to value their oral health. If they don’t, there’s nothing the oral healthcare team can do. They often place the expectation on the dentist to fix their problem, but nine times out of 10, it’s the patient’s responsibility. We can do the treatment, but it’s what the patient does when they get home -- how committed they are to those daily, lifelong oral hygiene habits -- that will ultimately decide the outcome.”

Prof. Banerjee uses shared decision-making to encourage patient accountability. He recalls:

“When I was training as a dentist many years ago, you told patients this is the problem and this is what you need. You basically lectured to them, which we know now is not the right thing to do.”

Instead, he recommends engaging patients in a two-way conversation, explaining the options, discussing the pros and cons, and taking into account their preferences and concerns. By making them an active partner in the decision-making process, practitioners can help patients to feel ownership over their treatment, increasing their commitment to following through with daily care.

Drive behavior change

At its core, Prof. Banerjee points out that dental caries is a behavioral condition. As such, preventing and managing caries is largely about changing behavior. This begins with motivational analysis to understand what drives a patient’s behaviors, decisions and attitudes towards their oral health. Prof. Banerjee says:

“It’s about tapping into the patient’s values, priorities, motivations and barriers to find the right psychological switches. By understanding why a patient behaves as they do, you can form a clearer picture of what will genuinely motivate that individual to adopt healthier habits. If you can do that, then you can encourage lifelong oral health.”

This sets the foundation for motivational interviewing techniques like open questioning, reflective listening and collaborative goal setting.

“If you want to change behavior, you don’t just tell somebody to stop. Human behavior doesn’t work that way. You have to set them small, achievable goals. If they’re drinking three liters of Coca Cola a day, your goal is to swap every third glass for a water. After three weeks, make that every second glass. And so you’re coaxing behavior change in a way that doesn’t overwhelm them.”

This approach, he says, is inarguably effective. However, he acknowledges that this so-called “soft skill” is one of the hardest to master.

“This is not something you can learn by picking up a book. It’s something you have to learn on the job by working and communicating with people. The best way to build this skill is to get the whole team together and actually role-play and practice. Try it with

patients and come back together and share what you've learned. This is the hardest thing you'll do as a clinician, but I believe it's also the most gratifying."

Involve the whole team

Speaking of the whole team, Prof. Banerjee believes that the traditional dentist-centric model is incompatible with the MIOC framework. He says:

"In order to deliver MIOC effectively, the entire oral healthcare team needs to be involved. Everyone has a role to play."

He encourages dentists to delegate to skilled team members, explaining:

"Dental hygienists and therapists can deliver a lot more than they're typically asked to in many places. Dental therapists in the UK are also trained to do operative procedures, for example. So if we utilize the whole team, it frees up time for the dentist to deliver highly specialized care like crowns, implants, bridge work -- things that can make a significant difference to a patient's oral health quality of life."

Redefine the "check-up"

To Prof. Banerjee, "check-up" is something of a controversial word. He says:

"We often use this term in the UK, but I believe it completely devalues a really important part of care. It sounds casual, passive and even trivial."

"Check-up", he explains, reinforces the idea that oral health care is reactive rather than preventative – if there are no symptoms, the patient feels there's nothing to check. It undermines the importance of screening and risk evaluation, positioning the visit as an optional formality instead of a critical first step in maintaining OHQoL.

Instead, Prof. Banerjee advocates for active longitudinal surveillance. This involves:

- Recalling the patient on a regular basis.
- Tracking diet, hygiene habits and previous behavioral interventions.
- Completing ongoing risk susceptibility assessments to monitor evolving risks.

This reinforces that oral healthcare is a continuous, proactive and necessary process, relying on shared responsibility between clinician and patient.

Advancing OHQoL with MIOC and Biodentine®

OHQoL is a multi-dimensional, evolving concept that, when delivered as part of the MIOC framework, has the potential to offer lifelong benefits to patients in every area of their health and wellbeing. As the boundary between oral and systemic healthcare blurs, Prof. Banerjee is excited to see a shift towards this style of personalized, biology-led dentistry where prevention, behavior change and advanced biomaterials work hand in hand.

Biodentine® exemplifies the MIOC philosophy, offering a bioactive, biocompatible material that preserves tooth structure, supports natural healing and contributes meaningfully to long-term OHQoL. As part of this holistic, patient-centric approach, it enables clinicians to deliver care that is genuinely life-enhancing. Prof. Banerjee concludes:

“The immediate biological impact of Biodentine® in the mouth is obviously a great benefit. But if you look at the impact on general health, mental health and psychological wellbeing, the long-term benefits of combining it with this approach can be truly profound.”

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Please read the instructions for use carefully before use, especially pay close attention to warnings, precautions, and contraindications. This medical device is a regulated health product. Communication to healthcare professionals only

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