

Will Dentistry Survive the Twenty-First Century?

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In Dentistry, as in many other fields, we use two words to develop a treatment plan: **WHAT** and **HOW**.

WHAT the patient has and **HOW**, I am going to fix it¹.

In Pediatric Dentistry, when things do not work and the patient asks **WHY**, we have no answers¹. How do we assume the responsibility when things do not go the way we want?

“Why does my child have caries again?”

In the past, we have escaped the valid question “why” from parents because we had an emergency way out: “Your child eats lots of sugar” and/or “your child does not brush well and enough.” Parents cannot quantify the word—*lots*—nor they can qualify the words—*well and enough*. However, today’s generations demand valid answers. We cannot dodge anymore our responsibilities.

In a sense, we have not paid too much attention to these inconsistencies because, in reality, we have not paid too much attention to prevention, because prevention does not pay. The big business is in treatments, re-treatments and abusing the operating room ...

Through the history of diverse health sciences, we find that some of them have greatly evolved thanks to technology, being the case of dentistry (resins, high speed handpiece, lasers, curing lights, digital radiography, Quantitative Light-induced Fluorescence etc.) Our guild has not been able to understand in depth the difference between technological and biological progress, and it has not managed to understand that the child is the subject to be changed to reduce or control oral problems.

The constant change of semantics, for example in Early Childhood Caries (ECC), does not change the outcome of the problem²⁻³. As technology advances, so technique changes and everybody is happy. For example, from amalgams to resins and from banding to bonding brackets. Unfortunately, the final result remains the same, because we do not answer the main question, which is: **WHY**¹. Why do these problems happen? Why have we not been able to control them?

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Since the beginning of humanity, there are records in different parts of the world on oral problems, as well as their attempt to alleviate them (healing)⁴⁻⁷. Today, science moves at such speeds that only by keeping our eyes wide open without forgetting our history. The importance of knowing our historical background is what allows us to advance with intelligence and confidence towards a better future in our profession.

In other words, the dental profession will continue in a perpetual disability if it does not fulfill the purpose of true understanding based on historical knowledge.

Prevention does not pay, because prevention to be attractive needs to be very well rewarded. We should be paid like Pediatricians, per visit, plus a large bonus because our overhead is huge compared to them. Let us compare: We are working in a Pediatrician complex sharing the expenses of the waiting room, the scheduling and the accountant. Our office is the same size of the Pediatrician office but we need to add space for the clinic, the laboratory, X-Ray, “silent room,” sterilization. We have to add very expensive dental equipment and materials and hire additional dental assistants and hygienists. We should be responsible for all the information given to parents and children because we need to create a bond with them. It is not the same as a nurse giving a vaccine than giving a local anesthetic in a child who needs to cooperate by opening his mouth. Can we charge more? Yes, we should. But who would pay? Treatment pays.

Today we are discovering that bacteria of each individual has unique components depending on individual’s genes, lifestyle, Psychosocial and environmental factors all interacting, interwebbing, mutating and adapting to constant daily changes throughout the patient’s life. Biofilm, behaves like an organized large city, with all services and utilities always adapting to the changing environment⁸. We—as the governing entity of our body—contribute directly and/or indirectly to maintaining the balance via diet control and oral hygiene, but we also contribute to develop a pandemonium causing caries and periodontal disease among others with all its consequences.

Dental caries is still a global health problem that affects the industrialized countries, and more and more frequently, the developing countries, especially in communities with greatest poverty⁹. The effects of oral diseases in terms of pain, suffering, functional deterioration and diminished quality of life are important and expensive. It is estimated that treatment represents between 5% and 10% of the health expenditure of the industrialized countries, and it is well above the resources of developing countries. The U.S. spent 140 billion dollars in oral health care, treatment and re-treatments

in 2018, whose population is equivalent to 4.27% of the total world population. Being very conservative, the world could be spending over a trillion dollars to treat dental problems. This expenditure maintains us afloat and happy. With the change in living conditions, dental caries will increase in many developing countries, mainly due to the consumption of sugars and inefficient prevention practices.

Once governments, insurance companies, health regulators, private dental companies, and startups, smart up and analyze data they will contribute more aggressively in the future dental market¹⁰⁻¹³.

With the digital revolution and connectivity, computers are simplifying, assisting, expediting and changing dramatically the world, making our lives easier and more complicated at the same time.

We are witnessing on a daily basis how technology improves making things smaller and faster. This revolution is merging biotechnology, bioengineering, infotechnology, artificial intelligence and data analysis via algorithms that can calculate 100 million bits of information per second¹³. The needed information is updated regularly and can be analyzed, interpreted and retrieved in a matter of seconds (eg. Google, Waze). We, as specialists, access it when a certain condition escapes our knowledge. And parents, with 5 minutes on Google, can challenge our years of education and experience.

In this sense, we trust automated processes that provide us with accurate and unbiased information. If traditional jobs are being replaced by robots (eg. car assembly lines) and machine learning has proven to be a better predictor than humans, what can dental and medical professionals expect?¹³

This is not science fiction or fantasy. We are not soaking our feet on a spring; we are starting to feel the force of the current. With the amount of rain pouring from technology, we will soon be sucked in and end up at the bottom of Technology Fall. We cannot fight it anymore, changes are here and we need to walk hand in hand and use what is given to us.

Governments could try to stop its expansion, such as they did with regenerative medicine, but nothing in the long run will be able to stop the flash flood. Dental schools need to be prepared and adapt to this new reality grasping today's modern world.

CONCLUSION

Let's not fool ourselves: because of patients' bio-socio-cultural factors, our lack of commitment as dental professional and/or parents interest, because the information we give is always a "one size fits all," and because prevention does not pay, we have done a lousy job in controlling caries. Just the opposite, caries incidence has been increasing steadily in the world. In life, when a gap exists, something or someone will fill the void. Will these be robotics and artificial intelligence? We need to keep in mind that the progress of technology should be embraced and integrated into our workplaces. If we do, dentistry could survive the twenty-first century, because we have the ability to bond and connect with people. However, School curricula needs to challenge the *status quo* and anticipate what the future is promising us.

We do not want the future telling a story which will start: "Once upon a time...."

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