Carlos Quiñonez
DMD MSc PhD FRCD(C)

What Might We Look Like in 50 Years?

As Editor of *Ontario Dentist* and someone who studies the dental-care market for a living, I have the privilege of making predictions about the various things that interest us professionally. And given that this is the 150th anniversary issue, there's no better time to ask: What might dentistry look like in 50 years? Below is my best effort at answering this question.

It is March 1, 2067. It's a regular day, and the year marks the 200th anniversary of the Ontario Dental Association. A dentist is leading and working alongside a variety of other oral health-care professionals in a large generalist and multi-specialty group practice. The practice is integrated with another similar, multi-provider, medical group practice. The dentist chose this work environment, as she wanted to be the leader of an oral health-care team, and was more interested in diagnosing and managing people's illnesses than completing all the surgical work herself. In fact, at graduation, she had a variety of employment options available to her. Consolidation of the dental-care market has resulted in a combination of "independents" (traditional solo-practitioners) and large multi-provider practices. Ownership is not limited to individuals and partnerships, but now includes corporate entities. Community water fluoridation is in all water systems, too, as the decision is now made provincially, since longitudinal studies determined beyond a reasonable doubt the medical safety of fluoride.

This morning, the dentist is treating a refugee family — a mother, father, two children and grandparents — who recently became permanent residents. They came to Canada seeking a better life, and the parents have just begun their respective professional re-certification processes, which are now governed nationally and include two years of professional education and a year of supervised practice which, in dentistry, occurs through a fifth year of dental education. The father was a dentist back home, and he's chosen the northern campus of the province's dental school, instead of its southern one, because he wants the family to settle in one of the only areas in the province that still has a relatively low oral health-care professional-to-population ratio. He's also interested in working in both the public and private sectors, and the fifth year of dental education in the northern campus provides good opportunities in this regard. As well, he will benefit from the province's loan-forgiveness programs for working in isolated and underserved communities.

As part of the resettlement process, the family had initially been screened for a variety of health-related conditions, including oral health ones. Medical education now trains physicians and nurses to recognize diseases of the oral cavity. It is also a basic part of primary care to triage individuals for oral health-related conditions and to provide clinical preventive therapies including agents (in the form of varnishes and mouth rinses) that arrest caries, and slurry pastes that are massaged into the gums to alleviate any acute inflammatory conditions of the peridontium. Of course, physicians and nurses don't replace dentists, but they have a truer understanding of the importance of good oral health and they ensure a strong referral pathway. In fact, all primary-care providers, including oral health-care providers, share a common electronic health record (EHR) and have a minimum set of data that they must collect, making it easy to safely transfer information between providers and refer efficiently.

Today, our dentist could see in the EHR that within a month of coming to Canada, the family she was treating had presented to a local, oral health-care provider with government-funded coverage that was limited to the treatment of pain, infection, and services that restore and maintain masticatory and social function, coupled with what were arguably competitive fees, or fees that at least met the dentist's overhead costs. By now, governments have realized that investing in oral health saves them money on the medical side; since the links between oral and systemic health are so great, most people simply talk about "health" — period. This recognition is particularly important for the grandparents, since an aging population and the associated co-morbidities, such as diabetes, rheumatoid arthritis, cardiovascular disease and cognitive health, are now routinely addressed in oral health-care settings. In fact, for those with significant co-morbidities, extra coverage is provided in Canada's national and provincially

administered system of oral health insurance, created specifically for those who fall below a specific income threshold (whether they be a refugee, immigrant, social assistance recipient, senior living on a fixed income, or otherwise).

At the appointment, the dentist's examination is completed electronically. Each individual has a unique key that grants health-care providers access to his/her health record. The medical history confirmed much of what was on the EHR, but in the oral health-care context, more specific questions are asked about each family member's oral health status, including subjective measures of oral health. All socio-demographic information (age, gender, income, education) is coded on the back end, as are clinical findings, diagnoses and services, which are recorded in real-time using voice recognition software at chair side (in fact, you can't get paid without providing a diagnosis). And given changes to privacy legislation, this information is anonymized and linked to provincial and national databases that collect such information for surveillance and population health-assessment purposes. These databases cover close to 90 percent of the population on the oral health-care side (depending on the population), as utilization is very high given the presence of both public and private insurance.

Private coverage is generally broader in scope, although all funders must pay for a core basket of services. Regardless, all funders now only generally pay for services where there is good evidence of therapeutic benefit, otherwise there are steep cost-sharing mechanisms that incentivize the appropriate use of care. As well, funders pay based on a blended model of fee per item, capitation and pay per performance, and they adjust for case complexity. Further, government and health-care professionals now negotiate their schedules of services and fees through a third-party arbiter linked to the omnibus, provincial health-professional regulator, which is made up of civil society, government and health-professional representation. The oral health-care professions, like all health-care professions, are now regulated by this arms-length government agency, largely because of the loss of public trust in the professions due to issues around fee disputes, accountability and transparency, and access to care.

In this refugee family, as with everyone, the two most common oral diseases remain caries and periodontitis. Clinically, risk assessment of oral disease is not as complicated as we thought in 2017. Looking at the causes of caries for example, we now know that level of education, income, and self-reports of recent stress and changes in diet provide as much predictive power as needed. Gone are the days when counting bugs was considered an important part of caries risk assessment. What has developed, though, is salivary testing that measures oral and systemic inflammation and molecular proxies of disease activity; this is a more refined assessment of periodontal disease and caries risk, yet funders will generally only pay for the cruder estimates. What is paid for, is saliva diagnostics to assess for a variety of systemic health conditions, which again makes referrals and integration between oral health and health-care providers far more frequent and important.

Oral health-care professionals use digital impressions and prepare teeth first mechanically, then use different forms of light energy and chemotherapeutics to help the tooth re-mineralize. Most restorations are milled chair side with new biomimetic and/or bioactive materials whose chemistry helps stop recurrent caries. We can now heal diseases of the hard tissues medically, not just surgically, and soon, industry is reporting that growing teeth will be an option by taking stem cells from pulps or from the nose. The animal studies have been successful, and clinical trials on humans have begun.

The science of behavioural change has also advanced, such that people now can pay for the services of a health coach, which provide a variety of different forms of motivational interviewing. For example, electronic messages are sent daily to remind people to exercise, eat healthily, brush and floss their teeth, etc., and people receive incentives in terms of real dollars from public and private funders if they improve their health. Yet to address equity concerns, once you achieve a certain level of health, those payments stop.

Could and would these things happen in our future? Are other futures possible? Likely so. This is just the way I see it. Most importantly though, dentistry can do a lot to shape this future — and I hope we do. Change is inevitable, so best to steward it for the benefit of the public and our profession. Here's wishing you a prosperous 2017 and beyond!

Dr. Carlos Quiñonez is the Editor of Ontario Dentist.