

# All about bacteria, disease and closing the oral-systemic gap

*In PART 1, we highlighted Anne's work and career that spans five decades as a practising dental hygienist, lecturer, educator and researcher. This final article in the two-part series focuses on what dental hygienists can learn from her experience and research in microbiology.*

**W**e associate a lot of good things with our mouths – smiling, savouring good food, enjoying a glass of wine, kissing that special someone. But it's also one of the most populated and potentially dangerous places on earth. Swarming with about 50 billion bacteria (100 million bacteria can live on a single tooth), it can be dirtier than a kindergarten pupil's hand, a public water fountain, even a toilet seat.

"The human mouth is a breeding ground for infection and disease, and it doesn't just stay in our mouths," says Anne Bosy, a dental hygienist who's made a career out of studying oral bacteria. "Science has shown they can be transmitted from one person to another like the flu, and can travel to the rest of the body, increasing the risk of everything from cardiovascular disease, diabetes, premature delivery and low birth weight babies to rheumatoid arthritis, and even Alzheimer's disease."

Anne's career started because she wanted to understand what causes bad breath. In 1993, armed with a Master's degree in science – the first ever awarded for the study of mouth odours – she opened (with dentist Julian Geller) the first clinic specializing in the treatment of halitosis. Finally, an embarrassing condition suffered by at least 50 per cent of the population was getting the attention it deserved.

## Probing questions

Anne's science-based approach was unique. "I measured everything to do with a client's tongue and teeth – pH levels, saliva, periodontal pockets and bleeding points, the amount of plaque and, of course, oral odours." She also asked her clients what and how often they ate, what medications they were taking, whether they exercised, if they felt stressed.

What she learned convinced her that bacterial growth and breath odour were inextricably linked, that lifestyle factors could influence bacteria levels in the

mouth, and that conventional treatment approaches, such as antimicrobial rinses, were only partially effective.

"I realized that the most effective treatment for breath odour and periodontal disease was a holistic approach with a few drugs thrown in," she says.

In 1996, Anne collaborated with a local pharmacist to develop the oral disease-fighting system she now oversees as senior vice president of Oravital Inc., the company she co-founded and which today licenses the technology to dental clinics.

## A healing solution

"We started prescribing systemic antibiotics to clients with breath odour and, within a couple of weeks, they started getting better. Then one day, after I had a tumour removed, the surgeon gave me a rinse and it healed my tissues. I thought maybe we could develop something that would make other people's mouths heal."

The first few antibiotic rinses had clients reporting a marked improvement in their mouths within two to three days. Prompted by one of her mentors, the late Dr. Walter Loesche, she conducted a study to explore the effect of these preparations on periodontal disease and breath odour. The University of Michigan looked at data from 1,000 cases and the results were astounding. "We showed an 87 per cent reduction in bleeding points and a 76 to 86 per cent reduction in pocket size."

Over the years, Anne has tweaked the recipe with new compounds developed in conjunction with partner pharmacies, and now offers three separate rinses that can be matched to the bacteria found in a client's mouth after samples are taken and analyzed in Oravital's government-certified laboratory.

Her advice for dental hygienists? "Measure the pockets and bleeding points, do the microbiology, maintain good bio-film control and educate your clients. Help them know what's normal and what's



Anne Bosy

not. Show them. Teach them. Don't just clean their teeth, and never say, 'it's only a little bleeding.'"

Anne recommends taking a few minutes to complete a diet preference checklist on every client. "Nutrition is a challenge. I had one client who was eating only one meal a day. His body was using energy from stored fats and he was breathing out ketones, which created an odour. The solution for his bad breath was simple – he needed to eat."

## Attention to overall health

She says people have to realize that oral health is important to overall health. "Bacteria in the mouth can travel through the body. We are now finding spirochetes in the brains of patients with Alzheimer's disease and fusiform in dead babies." Both of these bacteria are found in large numbers in the mouths of people with gingivitis and periodontal disease.

A new pharmaceutical module that educates University of Alberta dental hygiene students to prescribe certain antibiotics is an important breakthrough, says Anne, and one she hopes will spread to other provinces.

She predicts that dental hygienists of the future will begin to work in closer partnership with dentists, and even physicians, to close the oral-systemic gap. "We are moving from a profession that has been cosmetic-focused to one that will be more health-care-oriented. We have to. Anything less and we're failing our clients." •