

Eco-friendly Dentistry: Not a Matter of Choice

For many people, dentistry is not the first word that springs to mind when one hears the word “eco-friendly.” Dr. Ali Farahani hopes to change that. He opened Front Street Dental in Stratford, Ontario, in April of this year with the intent to make his practice as environmentally friendly as possible.

After years of warnings from scientists, environmental groups and the ecologically conscious, the ramifications of not caring for the health of the planet finally seem to have crept into the awareness of the general population. Extreme climate change, increased pollution, diminishing green spaces and vanishing plant and wildlife species are testaments to the need for a change in the way we approach the environment. But with eco-consciousness becoming a new trend and everyone from supermarket chains to car manufacturers looking for ways to create and market “green” products, it would be easy to brush off eco-friendly dentistry as yet another attempt to get in on the “green” trend.

However, environmental accountability, not marketing, is the reason behind Front Street Dental. Had you asked Dr. Farahani 5 years ago where he saw his dental career headed, he would not have imagined it like this. The opportunity to open an eco-friendly dental office came when he had the chance to start his own practice from scratch.

“It was a blank page. I had a choice, but I really didn’t have a choice. If I didn’t do it under these conditions, what was I waiting for?” says Dr. Farahani. “When one is able to act as an environmental steward, there is no other defensible, moral position.” He believes you cannot have healthy people on a sick planet, so with Front Street Dental, Dr. Farahani is taking an active role in caring for the planet as well as his patients.

Dr. Farahani prefers to use the term “eco-friendly” to “green” to describe his practice. While the definition of “green” is open to interpretation, he defines “eco-friendly” dentistry as an approach to dentistry that implements sustainable practices by keeping resource consumption in line with nature’s economy, by safeguarding the external environment through the elimination or reduction of outgoing wastes and by promoting the well-being of all those in the clinical environment by consciously keeping chemicals out of the air we breathe.

“This is more than just recycling office paper and plastics, which is already happening in neighbourhoods across the country,” says Dr. Farahani. “It is about changing consumption patterns.”

The Numbers Add Up

With his eco-friendly concept in mind, Dr. Farahani approached the environment and business program in the faculty of environmental studies at the University of Waterloo to partner on a research project that would compare the consumption practices of traditional dental practices to those of his proposed eco-friendly practice.

Graduating student Mittale Suchak agreed to take on this project as a fourth-year course toward her honours degree in the environment and business co-op program. The main goal of the project was to gather information from participating dental offices, compare the data on consumption practices, and then build an eco-friendly practice using as many sustainable methods established during the research as possible.

To understand what the normal consumption patterns are for a dental office during a typical workweek, Dr. Farahani and Ms. Suchak surveyed 5 dental offices, located in Waterloo, Haldimand County and Oshawa, Ontario. Their “Environmental Assessment Questionnaire” took into account patient volume, consumption of dental resources, electricity, energy, chemical and water usage, and waste. It also asked about the type of flooring, paint and lighting used in the office, as well as office equipment, including computer monitors and dental vacuum pumps.



Box 1 Eco-friendly recommendations

Here is a list of recommendations Dr. Farahani has for making your dental office more eco-friendly.

- Implement an eco-friendly sterilization program, which simultaneously eliminates the need for disposable autoclave wraps and disposable patient bibs.
- Use a community's existing recycling program to separately recycle the paper and plastic halves of autoclave bags.
- Use a dry dental vacuum pump, instead of a wet one.
- Use digital radiography instead of traditional film-based x-rays.
- If using traditional x-rays, recycle fixer and developer solutions and recycle lead foil from x-rays.
- Consider using less harmful surface disinfectants in dental offices, such as tea tree oil and thyme.
- Use reusable and biodegradable sundries wherever possible:
 - reusable operating room cotton towels instead of disposable plastic or paper patient bibs
 - reusable stainless steel high- and low-volume, surgical/endodontic suction tips as an alternative to disposable plastic
 - reusable glass irrigation syringe as a substitute for disposable plastic
 - biodegradable disposable cups instead of regular paper cups
 - chlorine-free, high post-consumer recycled paper products instead of traditional paper products.
- Use stainless steel prophylaxis cups instead of disposable prophylaxis-containing cups. This means purchasing prophylaxis paste in tubes or tubs. This also allows you to use only the amount of paste that is needed versus a predetermined amount, which is often more than you need, and thus wasteful and costly.
- Use disposable, plastic or paper barriers only as truly needed. An effective exercise would be for each office to do a one-day consumption analysis exclusively for barriers and then calculate how many barriers are used per week, month and year, and throughout one's dental career.
- Use an Energy Star washer and dryer, where applicable.
- Use fluorescent instead of halogen lighting, where practical.
- Use liquid crystal display (LCD) instead of cathode ray tube (CRT) computer monitors.
- Use linoleum, a more environmentally friendly choice for flooring.
- Use an ultra-low volatile organic compound (VOC) paint.
- Hire an environmentally friendly landscape company that uses natural growth product and procedures as an alternative to harmful pesticides to care for your office's lawn.

Because of the differing number of patients in the surveyed dental offices, the baseline number of patients for consumption comparison was set at 16 per day. Use of mercury in dental amalgam was excluded from the questionnaire because of the small scope of the research project and the large amount of information already published on the issue.

The resulting report, *Eco-friendly Dentistry: The Environmentally Responsible Dental Practice*, compares the environmental burden from conventional offices to the proposed eco-friendly office. In the report, Dr. Farahani recommends methods and resources that would make an office more eco-friendly (**Box 1**).

For example, the average number of papers in a typical chart in the offices surveyed was 12.3. The eco-friendly model uses 6 papers per chart and a digital chart system. In a dental office with 2,000 charts, this reduction would save 12,600 papers per year. In addition, all the paper at Front Street Dental is made from 100% recycled materials and is recycled.

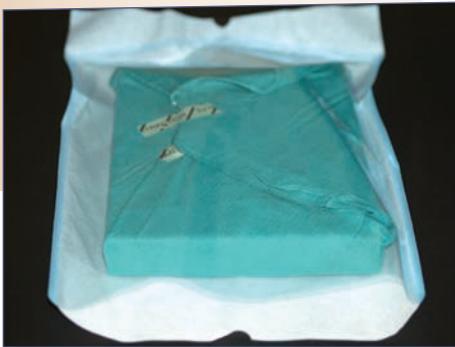
Dr. Farahani's practice saves approximately 24,600 gallons of water per year by using a dry dental vacuum pump. This is the equivalent of more than 570 bathtubs full of water. Wet and water-recycling dental vacuum pumps used by conventional dental offices can go through hundreds of gallons of water per day. The eco-friendly practice also uses digital radiography as an alternative to traditional film-based x-rays, eliminating the need for lead foil and silver-containing radiographic fixer solution, which, if not disposed of properly, can leach lead and silver into the water system. All of the offices surveyed used traditional film x-rays. However, 3 of the 5 offices recycled the lead foil, which can be arranged, says Dr. Farahani, through the lead foil supplier or an approved waste contractor.

Creating environmentally friendly methods for use in the dental office was not without its challenges. The greatest barrier was in finding eco-friendly alternatives to traditional dental products. One notable example is the disposable blue autoclave wraps for instrument sterilization cassettes.

Autoclave bags, which contain no biohazard materials, can be recycled in most communities after separating the plastic and paper portions of the bags. One of the surveyed offices already did recycle the bags, and a second office began doing this after the survey. The questionnaire revealed that the average number of autoclave bags used per day is 23.4. Calculated on a 200-day work year, that amounts to 4,680 pieces of autoclave paper and plastic being diverted from the landfill each



Reusable glass irrigation syringes and reusable cotton towels can reduce consumption of dental products.



Eco-friendly cassette sterilization method.

year, or more than 140,000 pieces over the course of a 30-year career.

However, to Dr. Farahani's knowledge, there is no reusable alternative to autoclave wraps; consequently, thousands of these are needlessly thrown into landfills yearly. So he developed a new pattern of cassette sterilization, which eliminates the use of disposable autoclave wraps and the need for paper or plastic patient bibs.

In this system, once the instrument cassettes have been washed, they are wrapped in cotton operating room towels. The wrapped cassette is placed in an autoclave bag, and the cassette and the towel are sterilized together. The autoclave bag ensures that microfibrils from the towels don't damage the autoclave machines, and the towel can then be used for patients instead of a disposable paper or plastic bib. After each use, the towels are washed in an Energy Star-rated washing machine before being sterilized in the autoclave system. The used autoclave bag is then separated and recycled.

Some other eco-friendly elements incorporated into Front Street Dental include Marmoleum flooring, an all-natural linoleum that is hypoallergenic, biodegradable, contains no formaldehyde

and releases no toxic volatile organic compounds (VOCs) into the air, and the office is painted with ultra-low VOC paint. Front Street Dental also uses a medical-grade air purifier, and most light fixtures, where possible, have compact fluorescent bulbs. Reusable or biodegradable sundries are used whenever possible, such as biodegradable cups and chlorine-free recycled paper towels.

A Blueprint for Action

Dr. Farahani hopes that his dental practice and the tangible data he has collected will be the impetus for other dentists to implement his recommendations into their own practices. "This model presents new, sustainable practices which fundamentally change waste and consumption patterns for dental offices," says Dr. Farahani. Although small in scale, he hopes that his project will be seen as an initial foray into the emerging area of eco-friendly dentistry and the basis for further research.

Often a significant barrier to being environmentally conscious is cost, which Dr. Farahani encountered in his own situation, and he thinks a long-term financial analysis to ascertain the economic advantages to eco-friendly dental practices would be a worthwhile project. "Certainly there are significant upfront and ongoing costs for doing eco-friendly dentistry," says Dr. Farahani. "There are no subsidies or grants to assist in these extra costs."

As for those who question whether or not the practices implemented comply with standard health regulations and infection control, Dr. Farahani notes that he took special care to do so. One of the main challenges was to abide by the strict laws of sterilization. For his reusable autoclaving system, numerous spore tests were performed to ensure the safety of the process. Instead of disposable irrigation syringes and surgical and endodontic tips, he uses reusable glass or stainless steel, which can be sterilized in the same manner as dental instruments. The all-natural cleaning supplies comply with the April 2002 Royal College of Dental Surgeons of Ontario advisory against harsh surface disinfectants to avoid contributing to creating resistant forms of bacteria or viruses.

All the procedures, practices and resources are well-documented and available for interested dentists. Dr. Farahani's goal in sharing his ideas is to reduce the amount of time and effort a dentist would need to implement these eco-friendly practices because he and Ms. Suchak have already done most of the work. By sharing his journey, he is hoping to start meaningful discussions with dental professionals on environmental responsibility and action.

But Don't Call Him an Environmentalist

In the report, Dr. Farahani states, "It is our belief that there should be no such term as 'environmentalists.' To refer to a segment of society who cares about the health and welfare of the planet as such is akin to using the term 'human rightists' for those who show compassion and offer aid to their fellow human beings."

This might seem contradictory to some. However, Dr. Farahani is not convinced activism works. He believes that the danger in labelling someone as an environmentalist is that others will refer the responsibility of being stewards of the environment to them. Says Dr. Farahani, "The world in general has to move towards a place where each of us is an active protagonist in the kind of world we want to see, rather than leave the responsibility for a particular cause to a particular group of people that we refer to as activists."

He doesn't just talk the talk. Although he grew up in Saint John, New Brunswick, Dr. Farahani spent a few years as a child in India. The tremendous amount of human suffering he witnessed stayed with him, and, along with a strong sense of morality instilled by his parents, helped him be more conscious of how he lives and his impact on the planet. He recalls his first concrete example of environmental stewardship during the summer of 1992 when he worked at a non-profit headquarters in Saint John. He used to see barrel after barrel of recyclable paper being discarded because no one had taken the initiative to put a recycling system in place. Dr. Farahani took on that responsibility, and when he left to go to university, the office continued to recycle. "Most people want to contribute to the common good," says Dr. Farahani. "Often, all that is needed is a little support, in one form or another."

Dr. Farahani went on to obtain a BSc in biology with a focus on conservation, and graduated with his dental degree from Dalhousie University in 2000. He chose dentistry as a career because of his intellectual interest in the structure and function of the body. "The health field was a natural choice," says Dr. Farahani. "Dentistry was the perfect fit because it demanded mental problem solving as well as hands-on dexterity to implement the solution."

Creating an eco-friendly dental practice presented another opportunity for problem-solving, and Paul Hawken's *The Ecology of Commerce*, and the documentaries *The Corporation* and *Manufacturing Consent*, were sources of inspiration for Dr. Farahani during the process. Dr. Farahani also regards Ray Andersen, CEO and chairperson of Interface, the world's largest carpet-producing company, as one of his heroes for his leadership in sustainable business.

The reaction so far to his eco-friendly office? "It has been wonderful," says Dr. Farahani. "Initially, there were some puzzled looks, as many people do not associate dental offices with the environment, either positively or negatively." However, after a discussion about what eco-friendly means to Dr. Farahani, people seem to have a better appreciation and understanding of the concept.

"My answer to people who say being environmentally friendly is too much work, or that it is irrelevant to them, is that there are volumes of solid evidence confirming global warming," says Dr. Farahani. "It is incumbent on a profession that prides itself on evidence-based practices to reflect and act on the most current evidence." Ultimately, he believes that each member of the dental community must follow his or her conscience when deciding to implement practical, eco-friendly changes to old, unsustainable consumption patterns.

Says Dr. Farahani, "All inhabitants on this planet have a right to its resources and to benefit from them. With rights come responsibilities, thus all inhabitants on this planet have a responsibility to be stewards of its resources. A person, be it a dentist or anyone else, may decide to abandon it, but this responsibility has no expiry and will remain unfulfilled."

Dr. Farahani is grateful to Mittale Suchak for her contribution to the project, as well as Cindy Poitras-Farahani, co-founder of Front Street Dental. Dr. Farahani looks forward to hearing from those who are interested in his report or who have other eco-friendly recommendations. You can contact him by email at dralifarahani@yahoo.com. ♦

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To listen to a complementary PowerPoint presentation on eco-friendly dentistry narrated by Dr. Farahani, go to the electronic version of JCDA at www.cda-adc.ca/jcda/vol-73/issue-7/581.html.