



Going Green with Eco-friendly Dentistry

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ABSTRACT

Eco-friendly dentistry is currently transforming the medical and dental field to decrease its affect on our natural environment and reduce the amount of waste being produced. Eco-friendly dentistry uses a sustainable approach to encourage dentists to implement new strategies to try and reduce the energy being consumed and the large amount of waste being produced by the industry. Many reasonable, practical and easy alternatives do exist which would reduce the environmental footprint of a dental office were it to follow the 'green' recommendations. Dentist should take a leading role in the society by implementing 'green' initiatives to lessen their impact on the environment.

This article provides a series of 'green' recommendations that dentists around the world can implement to become a leading Stewards of the environment.

Keywords: Eco-friendly, Environment, Green, Atmosphere.

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INTRODUCTION

Providing good dental care is the prime objective for any clinician. Good dental care means giving the best to the patient and this includes creating a comfortable and patient friendly atmosphere. Dentistry has evolved in terms of materials and the techniques. The recent materials and treatment techniques promises to provide the best to the patient. In order to provide best to the patient the environment should not be damaged. The modern methods of patient care demand a price to play, in the form of heavy loads of landfills, garbage and biomedical waste. These wastes have an adverse effect on the environment. Although individual dentists generate only small amount of environmentally unfriendly wastes, the accumulated waste produced by the profession may have a significant environmental impact.¹⁻³ Raw materials and new materials are exploited because of reduced recycling and increase in

demand.⁴ There is contamination of ground water and aquifers by leakage produced by decaying matter and off gassing of methane. Incinerators are commonly used to dispose off this type of waste. The by-products of incinerators such as carbon dioxide and sulfur dioxide can cause global warming. Ash produced from incinerators can be a source of contamination.⁵ Atmospheric concentration of carbon dioxide, methane and nitrous oxide have increased significantly since 1960s. These gases namely, carbon dioxide and methane are leading cause of global warming. Methane is mostly released from landfills and can absorb 23 times as much infrared radiation as carbon dioxide, warming the earth's surface.

Medical and dental industry play a crucial role in producing and adding to the amount of waste hauled off to landfills. Many environmental and health issues stand testament to the need and to reduced waste deposited in landfills each year.

ECO-FRIENDLY DENTISTRY

'Eco-friendly' and 'Green' are terms that are widely used today and can indicate several things, such as renewability, sustainability, energy efficiency, nontoxicity, being minimally invasive, having a reduction in carbon foot print, and having a reduction in carbon dioxide emissions. By combining the health of humans with the health of our environment, ecofriendly dentistry provides an opportunity to reduce further degradation⁶ of our planet. Almost every health care setting worldwide-hospitals, extended-care facilities, urgent-care facilities, medical offices, and dental offices-utilize PBT (persistent bio-accumulative toxins) such as mercury, lead, PVC, DEHP, VOCs (volatile organic compounds), PBDEs (polybrominated diphenyl ethers) and HBCDs (hexabromocyclododecans), and other harmful elements, which with exposure can adversely affect the health of team members, patients, and the environment. As early as 1994, the US. Environmental protection agency

identified medical waste incineration as the leading source of dioxin, a potent carcinogen. The US ranks the health care sector as the 4th largest source of mercury air emissions due to their contribution via medical/dental waste incinerators. Given these facts, it becomes an inherent duty and obligation for the entire dental community to follow suit as integral members of health-care community. This is where Eco-friendly dentistry™ has emerged. The term Eco-friendly dentistry has been coined and trademarked by the founder of Ora Dental Studio™, the nation's first green group dental practice.

DEFINITION OF ECO-FRIENDLY DENTISTRY

Eco-friendly dentistry is a newly evolving practice of dentistry, which encompasses a simultaneous devotion to simultaneous devotion to sustainability, prevention, precaution, and a minimally invasive patient-centric as well as global centric treatment philosophy. Eco-friendly dentistry, through green design and operations, protects the immediate health of patients and team members, the health of the surrounding community, and the health of global community and natural resources.

In June 2009, the Eco-friendly dentistry association was launched internationally. There are dentists residing in 20 US states as well as some in Canada, who have joined the association in order to help offices around the world become better suited for the environment.⁷ Dr Fred Pockrass and his wife Ina started Eco-friendly in order to recruit many professionals into this association. We generate much waste in dental offices daily. Everything from gauze to chair cover to headrest covers to amalgam to X-ray development chemicals end up in landfills.

HOW TO GO GREEN

Green Building and Leed

Green building is the practice of increasing efficiency with which buildings use resources-energy, water and materials. Green building focus on the use of natural materials that is available locally.

LEED stands for Leadership in Energy and Environmental Design. Developed by the US Green Building Council in 2000, it is a rating system for green buildings and represents the nationally accepted benchmark for their design, construction, and operation. LEED ratings reflect sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

Electronics in the Office

When the computer is not in use, shut it down or at least put it to sleep or stand-by mode which causes the computer to consume 70% less electricity.

Lighting

Use compact fluorescent light (CFL) bulbs. They last 8 to 12 times larger than incandescent, at a quarter the cost per hour. They also produce 70% less heat than incandescent when illuminated.

Paper and Building

Paper is not only a waste product; it's expensive and diminishes natural resources. By reducing the amount of paper used in the office, we can reduce the amount of paper needed to be stored or purchased. Hence, everyone should think before printing and make sure everything is accurate before hitting the print button. When printing a document that may not be final, print it in draft mode. The draft mode uses approximately 50% of the ink used in normal print mode. Some softwares like ecoPrint Ink and Toner Saver are available that can reduce up to 75% of ink usage.

Digital X-rays

Traditional X-rays result in significant and pollution. Digital dental radiographs expose patients to 70 to 90% less radiation exposure than traditional X-rays. By going digital, we would no longer generate paper, plastic, or lead waste by discarding empty film packets and no longer would we be dumping developer and fixer into drains and water supplies. Digital images also require 75 to 90% less radiation than conventional images.

Paperless Office

Convert the office to chartless or paperless by utilizing practice-management software. Most softwares (e.g. Dentrix, Practice Works, Softdent, Eagle Soft) are set up. So we can do just anything and everything via computer. Consider sending text and communications via e-mail instead of sending postcards and statements through the mail.

Amalgam Separator

Silver amalgam is one of the most commonly used permanent restorations for the teeth. Although dental amalgam is a durable, cost effective and long lasting restorative material,⁸⁻¹² it contains mercury, silver and other metals that can enter the environment.¹²⁻¹⁶ Mercury is biocompatible and is known to have toxic effects in plants, animals and humans.^{2,12,17-19} Currently it has been estimated that dentists contribute between 3 and 70%^{10,14,19-21} of the total mercury load entering waste water treatment facilities. Hence, the most important environmental initiative for any dental office is to install an amalgam separator. This equipment keeps mercury filling material from entering

water supply. A number of ISO 11143-certified amalgam separators are able to reduce amalgam particles in dental waste water by more than 95%.^{3,12,14,22-28} These devices separate the fine particles (generated during restoration finishing, polishing and removal procedures) from waste water^{11,16} thereby limiting the amount sent to waste water management facilities of the environment. Amalgam separators are readily available, relatively inexpensive and a low maintenance piece of equipment.

Waterless Vacuum System

Dental vacuum systems can use as much as 360 gallons of water per day. With the world facing a serious water crisis, we should not be pouring this precious resource down the drain. High tech, dry vacuum systems accomplish the same results yet use no water at all.

CAD/CAM Systems (Inoffice Laboratory Restorations)

It is a convenient completion of lab quality restorations in single appointment. It reduces greenhouse gases produced from patient and staff travel for the multiple appointments, and the shipping of impressions and final restorations, sometimes as far as overseas.

Infection Control

Dental office infection control and sterilization processes can be a major source of pollution and waste in the traditional dental practice. Chemicals used in infection control and sterilization processes in the dental office can be quite dangerous. They can jeopardize employee health, contribute to poor office air quality and can pollute our community water stream. In the Eco-friendly practice, replace chemical based sterilization with steam sterilization. Toxic cold sterilization methods are eliminated.

FOUR 'R's

The key to reducing our waste is to extend the life of things we use. Health professionals are on the leading edge of helping to heal our planet by introducing the four 'R's—Re-think, Reduce, Re-use, Recycle.²⁹ It is common to think of recycling as the first solution to handling our trash, but reducing and reusing are actually much more effective. And by implementing these 4 easy steps, dentistry and dental hygienists are beginning to transform the medical industry into a more sustainable one.

REDUCE

In order to decrease the pressure on the earth's resources, people must decrease or reduce their consumption of them.

Packaging accounts for 33% of garbage. Purchase of products with minimal packaging and use of reusable plastic container (e.g. For cleansing and disinfecting solutions) can reduce general waste production.²⁴

Examples of dental office opportunities to reduce:

- Purchase often used items in bulk for, e.g. Prophylaxis paste, masks, hand gloves, etc.
- Request supply companies combine orders to cut down on shipping boxes.
- Set printers for double sided printing. Single-spaced printing and use of both sides of pages can decrease the amount of paper used in the dental office.⁶
- Implement digital technology for imaging impressions, cancer screening, charting and marketing.
- Use steam sterilization eliminating the use of chemicals.

REUSE

This step helps us to prolong the use of items. Extending the life cycle of an item by re-using it eliminates the need to transport it away. Plastic, single use items can be replaced with stainless steel ones that can be sterilized and reused for years, like impression trays. Reuse of materials saves the resources and gives the material new life by using it second time in a new way.⁷

Examples of dental office reusable:

- Switch to cloth sterilization bags and patient barriers.
- Wear cloth lab coats instead of paper ones.
- Use a reusable face shield.
- Reuse lab and shipping boxes.
- Switch to stainless steel impression trays, suction tips.
- Provide glass or ceramic rinse cups.
- Use washable dishes and cutlery in the staff break room.

RECYCLE

Recycling should be our last resort and we need to do a much better job recycling everything that we can. Recycling is a viable way to reduce overall contamination of the environment.²

Examples of dental office recyclables:

- Participation in an instrument recycling program that turns them into industrial metal.
- Use sharp disposal service that recycles them into building materials.
- Recycle copy paper and choose a medical shredding service that recycles the shredded paper.
- Provide recycling bins for staff break-room waste.

RETHINK

Every decision is made with a certain mindset, and redeveloping a mindset is a strategy for change. Environmentalism and

sustainability are both considered states of the mind. Rethinking the way that dentist offices are seen is the initial step in trying to change the modern practice. Implementing simple changes like things we can add or change, and decrease energy and water consumption are the initial strategies to consider.

CONCLUSION

Green dentistry is a high-tech approach that reduces the environmental impact of dental practice and encompasses a secure model for dentistry that supports and maintains wellness. Green dentistry meets the needs of millions of wellness life style patients, and helps dental professionals protect planetary and community health, as well as the financial health of their practices. As health practitioners, we should be concerned with promoting not only human health and well-being but also that of the environment.

Being 'green' in dental practice will make one feel better about oneself and what we are doing for humankind.

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