

# Go green: a new prospective in dentistry

## Abstract

Green dentistry is an environmentally friendly way of practicing dentistry. Green dentistry or eco-friendly dentistry is a high-tech approach that reduces the environmental impact of dental practices and encompasses a service model for dentistry that support and maintain wellness. Green house gases are the byproduct of energy production and are a major threat to a healthy planet. They hold heat in the atmosphere. Experts agree that 350 parts per million is the safest level of green house gas in our atmosphere. Currently our green house gases measure 388 parts per million and the number rises by 2 points every year. Thus this review focuses on steps to conserve energy and reduce green house gases in our dental practice.

**Keywords:** green dentistry, eco dentistry, reusable, biodegradable

Volume 1 Issue 1 - 2017

Vikram Pal Aggarwal,<sup>1</sup> Ashish Kakkar,<sup>2</sup> Shobit Singh<sup>3</sup>

<sup>1</sup>Department of Public Health Dentistry, Surendera Dental College & Research Institute, India

<sup>2</sup>Department of Pedodontics and Preventive Dentistry, Jan Nayak Ch. Devi Lal Dental College, India

<sup>3</sup>Department of Orthodontics & Dentofacial Orthopedics, Swami Devi Dyal Hospital and Dental College, India

**Correspondence:** Ashish Kakkar, Senior Lecturer, Department of Pedodontics and Preventive Dentistry, Jan Nayak Ch. Devi Lal Dental College, Sirsa, India, Email [Ashishkakar764@gmail.com](mailto:Ashishkakar764@gmail.com)

**Received:** October 17, 2017 | **Published:** November 14, 2017

**Abbreviations:** EDA, eco dentistry association; USGBC, united states green building council; LEED, leadership in energy and environmental design; PBT, persistent bioaccumulative toxins; VOCs, volatile organic compounds; PVC free, polyvinyl chloride free; GGHC, green guide for health care; CSR, corporate social responsibility; EPPS, environmental purchasing of products and services

## Introduction

Green dentistry is an environmentally friendly way of practicing dentistry. It involves using methods and machines to reduce waste, conserve energy and decrease pollution. Aside from helping to protect the environment, going green can also help to save money and time.<sup>1</sup> In this day and age everyone is doing their bit to preserve the environment, and increasing number of dentists are taking steps to help save the environment; from switching to different types of technology to turning off taps and lights, every little helps. So, green dentistry helps to identify simple measures dentists and their patients take to reduce waste and conserve energy, as well as promoting awareness of the environment and getting local communities involved in green living. Thus, it is a high-tech approach that reduces the environmental impact of dental practices and encompasses a service model for dentistry that supports and maintains wellness.<sup>2</sup>

## History

In 2008, the eco dentistry association was co-founded by Dr Fred Pockrass and his wife, in a Pockrass. The eco-dentistry association (EDA) provides “education, standards and connection” to patients and dentists who practice green dentistry. The EDA aims to help dentists “come up with safe and reusable alternatives that lower a dentist’s operating cost by replacing paper with digital media whenever possible.”<sup>3</sup> “After the inception of the EDA, the dental industry saw more dentists and oral surgeons choosing to make their offices environmentally friendly. As of February, 2011, the EDA has approximately 600 members. Mint dental works in Portland, Oregon was the first lead-approved and certifiably green dental office in the United States.”<sup>4</sup>

## Reasons to choose green dentistry

### Reason 1: Green dentistry is safer for you

Green dentistry is actually safer when compared to other dental methods, making patient safety prime reason for selecting green dentistry. With digital x-rays, exposure to radiation is significantly reduced, often by as much as 80 to 90 percent. Mercury, a controversial substance in dental restorations, is never featured in any green dental treatment.<sup>3</sup>

### Reason 2: Green dentistry is safer for the environment

With no film chemicals required for x-rays and much less paper used, green dentistry is just another step to living in a greener world. Just like other businesses and industries getting on to the band wagon, even dentistry can be helpful to the environment.<sup>3</sup>

### Reason 3: Stronger, more natural restorations

Because green dentistry eschews Mercury due to its controversial nature and potential harm, metal is never used in any dental restorative options. As a result, green dentists use ceramic and composite restorations, which naturally taken on the color of teeth.<sup>3</sup>

### Reason 4: Less chemicals and disposables

Typical dental offices use numerous disposables and chemicals in their day-to-day operation. While disposables are helpful in maintaining sterilization, the greener option is to avoid them, resulting in less hazardous waste. Instead, green dentists use high-tech autoclaves and other non-hazardous sterilization techniques. Green dentistry can still be clean, yet makes less garbage.<sup>3</sup>

### Reason 5: Green dentistry is not a fad; it’s here to stay

With more and more dental offices turning to energy-efficient and patient safe options, it’s hard to call green dentistry a fad. As more businesses and industries look to greener options, so too will dentistry follow in these environmental footsteps for years to come.<sup>3</sup>

## Elements of eco-friendly dentistry

Specific elements in office and building construction, office operations and patient practices distinguish the practice of eco-friendly dentistry in comparison to traditional dentistry.

### Building and office construction

Careful planning and construction of a green building, including membership with the United States Green Building Council (USGBC) and building facilities in accordance with Leadership in Energy and Environmental Design (LEED) guidelines as a national benchmark for constructing green buildings. Utilizing green interior design finishes, and textiles, including interior elements that are free of Persistent Bioaccumulative Toxins (PBT) and Volatile Organic Compounds (VOCs) and that are made from post-industrial or post-consumer waste or come from sustainable resources.<sup>4-6</sup>

### Patient practices

- a) Practicing metal-free, mercury-free dentistry with no amalgam.
- b) Use of non-toxic, green cleaning and sterilization products and supplies.
- c) Use of only Green Seal approved products and materials.
- d) Certification with EDA Green DOC Program.
- e) Use of dry-heat or steam sterilization vs. chemical sterilization.
- f) Recycling of broken or non-usable instruments in a program like Hu-Friedy's Environment program.
- g) Utilizing Bis (2-ethylhexyl) phthalate-free phthalate (DEHP-free), Polyvinyl chloride-free (PVC-free) surgical tubing and Intravenous fluid bags.
- h) Use of lead-free patient x-ray aprons and shielding.
- i) BPA-free composite resins and oral appliances.<sup>4-7</sup>

### Office operations

- a) Paper less patient charting and registration, electronic claims, electronic patient recall and reminders.
- b) Digital radiography eliminating film manufacturing, toxic chemical processors and fixatives and reducing patient exposure to radiation.
- c) Environmentally conscious purchasing of products and services.
- d) Significant decreases in solid waste production and high ratios of recycling. Paper goods and products only from FSC certified sources.
- e) Utilizing the authoritative benchmarks set forth by the Green Guide for Health Care (GGHC) and the Eco-Dentistry Association (EDA).
- f) Utilizing 100% sustainable energy to power any facility.
- g) Offsetting CO<sub>2</sub> with certified carbon offsets and investment into reforestation campaigns.
- h) Formulating a green team with designated responsibilities and goals.
- i) Recording and publishing metrics in relation to bio-hazardous

waste, solid waste, recyclables, water consumption and energy consumption in order to set annual goals, implement improvements, and to compare to national benchmarks.

- j) Incorporation of a formal Corporate Social Responsibility (CSR) program within the cooperate structure.
- k) Elimination or diversion of bio-hazardous waste through Demolisher II units and/or Pella-DRX.
- l) Use of amalgam separator or mercury eliminator to prevent mercury from entering and contaminating municipal water system.
- m) Use of dry vacuum systems and bulk instrument sterilization systems, in addition to automated low-flow faucets, and toilets for water conservation.
- n) Formal Environmental Purchasing of Products and Services (EPPS).
- o) Creating formal mission statement and adhering to the precautionary principle.<sup>4-6</sup>

## Waste reduction

One of the easiest ways to start a going green initiative is to develop a waste reduction plan. Whenever possible, waste reduction plans should include the four R's: Recycle, Reduce, Reuse and Rethink.

### Recycle

An office can begin by recycling all aluminum, glass, plastic and paper; including cardboard by utilizing recycling-containers. Recycling containers must be visible and located in areas of easy access for best results. Dental reception areas are a great place for clean, covered aluminum and paper recycling containers. A container to hold lead foil from film packets should be in the darkroom or next to the automatic developer. A container for packing materials should be near the area where supplies are checked in for storage. A container for paper recycling can be placed near the printers and fax machine. A container for paper and plastics should also be in the office break room to collect items after lunches or staff meetings.<sup>1-8</sup> Use recycled toner and inkjet cartridges and it is a great cost saving measure for the practice. Discontinue the use of disposal kitchenware or make sure to only use biodegradable plastic ware. Labeling personal cups, plates, etc., with staff names also prevents the spread of illness between co-workers reusing unlabeled permanent kitchenware. Purchase recycled materials such as toilet tissue, paper towels and office furniture, when possible. Buy rechargeable batteries for digital cameras and flashlights, and re-tip or transform broken instruments for other purposes also aid in recycling efforts.<sup>1-8</sup>

### Reduce

The easiest way to have more of a resource is to use less of it. Teaching patients to turn off the water until needed during tooth brushing will save water and money. By drinking tap water from personal water bottles, the office will reduce plastic bottle waste and save money. The ultimate way to reduce in the dental office is to go "paperless" by using computer and digital technology, sending and receiving faxes and communicating with patients and vendors through emails. Eliminate the use of plastic bags by using paper when possible. Purchase all copy paper with a minimum of 50% Post-Consumer. Purchase janitorial paper with a minimum of 35% PCWC.<sup>9,10</sup>

## Reuse

Using sterilizable stainless steel evacuator tips and saliva ejectors can reduce the use of disposables in the practice. Switch to cloth sterilization bags and patient barriers. Wear cloth lab coats instead of paper ones. Use re-usable face shields. Re-use lab and shipping boxes. Switch to stainless steel impression trays. Provide glass or ceramics

rising cups. Use washable dishes and cutlery in the staff break room.<sup>1</sup>

## Rethink

Rethinking office practices and protocols may reveal ways to reduce, reuse, and recycle. Implementing small, affordable changes will still make a significant impact on long term environmental sustainability<sup>1</sup> Table 1.

**Table 1** Dental waste disposal checklist

Waste	Type	Option
Amalgam particles <sup>9-12</sup>	Traps, screens, excess mix	Send to a recycler or, Dispose of as a hazardous waste
Waste mercury <sup>9-12</sup>	Spills, spill cleanup	Manage as hazardous waste by sending to a recycler
Empty amalgam capsules <sup>9-12</sup>		Dispose of in the garbage
Fixer <sup>13</sup>	X-ray processing	Contract to have silver reclaimed Install silver recovery system Dispose of as a hazardous waste
Waste	Type	Option
Combined fixer and developer	X-ray processing	Purchase kit from x-ray manufacturer to separate, and use methods listed for fixer and developer
Chromium containing x-ray	X-ray system cleaning	Switch to non-chrome cleaners Dispose of as a hazardous waste
Disinfectants <sup>12-14</sup>	Used	Discharge to sewer
Chemoclave chemicals <sup>12-14</sup>	Used	Discharge to sewer
	New	Call your local sewer treatment plant
Lead foils and shield <sup>12-13</sup>	X-ray processing protective shields	Send to metal reclaimer Dispose of as a hazardous waste
Blood <sup>14</sup>	Liquid	Discharge to the sewer
	Dripping swabs, etc.	Dispose of as infectious waste
	Non-dripping swabs, etc	Dispose of in garbage
Waste	Type	Option
Sharps <sup>12-14</sup>		Infectious waste treatment facility or registered sharps collection station
Office waste <sup>9-14</sup>		Recycle as much as possible

## Conclusion

Green is no longer just a color. The going green movement, which is rapidly becoming a worldwide priority, seeks to address environmental contamination, waste and other critical environmental issues. Dentistry can lessen the combined environmental impact by utilizing the “Four R’s of Going Green,” namely “Reducing, Reusing, Recycling, and Rethinking.” These can be easily applied to the dental office.<sup>11-14</sup>

## Acknowledgements

None.

## Conflict of interest

The author declares no conflict of interest.

## References

- VittalDas Shetty. Green dentistry. *Journal of Indian Association of Public Health Dentistry*. 2011;9(18):891–893.
- <http://www.cosmeticdentistryguide.co.uk/articles/ecodentistry.htm#st-hash.aVDb8qVa.dpuf>.
- Adams E. Eco-Friendly Dentistry: Not a Matter of Choice. *J Can Dent Assoc*. 2007;73(7):581–584.
- Eco-friendly dentistry. Wikipedia, the free encyclopedia.
- Westman JF. Creating a supportive environment. An update from the Minnesota Dental Association’s Committee on Environment, Wellness and Safety. *Northwest Dent*. 2003;82(1):27–47.
- Wilson NH, Bellinger EG, Mjor IA. Dental practice and the environment. *Int Dent J*. 1998;48(3):161–166.

7. Garla, Bharath Kumar. Green dentistry; Ecofriendly dentistry: Beneficial for patients, Beneficial for the environment. *Annals & Essences of Dentistry*. 2012;4(2):72–74.
8. Crest® Oral–B® at dentalcare.com Continuing Education Course. 2011.
9. How to prevent pollution from your dental practice. A Guide for Dentists .IDEM, India; 1995. p. 1–11.
10. Balfry G. Green dentistry. *British Dental Journal*. 2001;191(7):356.
11. Westman JF. Recycling amalgam and keeping it simple. *Journal of Northwest Dentistry*. 1997;76(4):19–24.
12. Palenik CJ. Managing regulated waste in dental environments. *Dentist Today*. 2004;23(4):62–63.
13. Swanson RL, Roethel FJ, Bauer H. Reuse of lead from dental X-rays. *N Y State Dent J*. 1999;65(3):34–36.
14. Kishore J, Goel P, Sagar B, et al. Awareness about biomedical waste management and infection control among dentists of a teaching hospital in New Delhi, India. *Indian J Dent Res*. 2000;11(4):157–161.