

Dentistry's Greener Future

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Abstract: *Dentistry is most importantly and foremost a healing profession but in this process dentists generate wastes in their practices that challenge global environment and human health. Dental professionals have a responsibility to conserve natural resources and reduce toxic wastes produced from their products. Green dentistry in such scenario is currently transforming the dental field to decrease its affect on environment and reduce the amount of waste being produced. It is based on waste reduction, energy conservation and pollution prevention. It is an innovative way of dental practice which is environmental friendly and at the same time conserves money and time by reducing waste, conserving energy and decreasing pollution with the use of latest techniques and procedures.*

Keywords: Green dentistry, pollution, innovative

1. Introduction

Today environmental pollution is one of the most serious issues people are facing around the globe. Environmental pollution is leading to global warming which is disturbing the balance of nature and wrecking havoc all around the globe¹. Dental health care is devoted to endorsing and enhancing oral health and well-being and to achieve such goals, dentists use a diversity of materials and instruments. It produces a large amount of waste in the form of amalgam, lead biomedical and general office waste.²

Dentistry has a substantial contribution to the pollution generated by the waste material, source of energy used, use of paper and use of toxic material in dental practice. This emphasizes that although dentistry deals with promotion and maintenance of health, at the same time contributes to pollution. To counter the ill-effects as stated, more recently, the term "Eco-Dentistry or Green Dentistry" has been pioneered which has taken dentistry beyond the point of preventing pollution to a place of promoting sustainability.²

The term 'green' is defined as 'actions that reduce the impact on the environmental, such as eco purchasing or recycling'. Green innovations are therefore being considered across all spheres of life and the healthcare sector is no exception; this is especially due the fact that it produces large quantities of waste and also consumes a lot of energy, water, and other resources.¹

In 2008, Eco-friendly Dental Association (EDA) was cofounded by Dr. Fred Pockrass and his wife Ina Pockrass. EDA provides "Education, standards and connection to patients and dentists who practice green dentistry." EDA aims to help dentists "Come up with safe and reusable

alternatives that lower a dentists operating cost by replacing paper with digital media whenever possible."³

Eco-dentistry association defines green dentistry as "a high-tech approach that reduces the environmental impact of dental practices and encompasses a service model for dentistry that supports and maintains wellness". It is based on waste reduction, energy conservation, and pollution prevention. The purpose of this review is to raise widespread awareness of environmental alternatives in the dental community and to provide a series of "green" recommendations that dentists around the world can implement to become leading stewards of the environment.³

Waste Reduction⁴

Four processes are responsible for most dental practice waste product which is as follows:

- 1) Infection control methods including disposable barriers and sterilization items and toxic disinfectant.
- 2) Conventional x-ray systems- Conventional x-rays create trash and toxic chemical-waste that the dental office is left to dispose of.
- 3) Conventional vacuum systems- Suction systems, also known as dental vacuum systems, are a critical piece of machinery for any dental office. Unfortunately, they use a tremendous amount of water.
- 4) Placement and removal of mercury-containing dental material- Amalgam-filling material includes equal parts of elemental mercury and an alloy powder mostly composed of silver, tin, and copper. Mercury in drinking, irrigation, and fishing waters is a serious environmental and human-health concern.

4Rs

One of the easiest ways to start a going green initiative is to develop a waste reduction plan.



Figure 1: 4Rs of Green Dentistry

Whenever possible, waste reduction plans should include the four R's:

Rethink⁴

Implementing small, affordable changes can make a significant impact on long term environmental sustainability. Thinking about practices and protocols and discussing them with dental team may reveal ways to reduce, reuse, and recycle.

Reduce

In order to decrease the pressure on the earth's resources, people must decrease or reduce their consumption of them.²

- Purchase often used items in bulk for, e.g. Prophylaxis paste, masks, hand gloves, etc.²
- Request supply companies combine orders to cut down on shipping boxes.²
- Set printers for double sided printing. Single-sided printing and use of both sides of pages can decrease the amount of paper used in the dental office.²
- Implement digital technology for imaging impressions, cancer screening, charting and marketing.²
- Use steam sterilization eliminating the use of chemicals.²
- Use a dry dental vacuum pump, instead of a wet one.⁴
- Reducing the consumption of disposable items used in dentistry would help in the preservation of the environment.⁴
- The ultimate way to reduce in the dental office is to go "paperless". Going paperless involves the office using computer and digital technology whenever possible to create, use, and store office records.⁴
- Eliminate the use of plastic bags by using paper when possible.⁴

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.

Examples of dental office reusable:

- Switch to cloth sterilization bags and patient barriers.²
- Wear cloth lab coats instead of paper ones.²
- Use a reusable face shield.²
- Reuse lab and shipping boxes.²
- Switch to stainless steel impression trays, suction tips.²

- Provide glass or ceramic rinse cups.²
- Use washable dishes and cutlery in the staff break room.²

Recycle⁴

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.

Various ways of recycling are as follows:

- 1) Capture and recycle: Dentists can collect and store all contact and noncontact scrap amalgam for recycling. This waste must be sent to an approved recycler that is able to reprocess the mercury.
- 2) Installing an amalgam separator not only keeps this mercury-containing material out of the water system, but recycling waste amalgam means that more of the material does not have to be created.
- 3) If using traditional x-rays, recycle fixer and developer solutions and recycle lead foil from x-rays
- 4) In the office rest room, discontinue the use of disposable kitchenware or make sure to only use biodegradable plastic ware. Washing and reusing basic kitchenware will reduce plastic waste
- 5) Another way to recycle is to always use recycled toner and inkjet cartridges and it is a great cost saving measure for the practice
- 6) Use of recycled materials such as toilet tissue, paper towels, and office furniture, when possible
- 7) Buy rechargeable batteries for digital cameras and flashlights, and retip or transform broken instruments for other purposes also aid in recycling efforts
- 8) Hand instruments: For over 12 years, Hu-Friedy has offered a program called EnviroDent, which allows practitioners to recycle old hand instruments and receive a free instrument for helping the planet
- 9) Use a community's existing recycling program to separately recycle the paper and plastic halves of autoclave bags.

2. 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. Dentistry can lessen the combined environmental impact by utilizing the Four R's of going green (recycle, reduce, reuse, and rethink) can be easily applied to the dental office. Infrastructure for proper disposal and treatment of dental waste needs to be better developed and awareness of the same should be created.

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