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GREEN ROUTE INDEED A NEED FOR DENTAL PRACTICE: A REVIEW

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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. In today's world, it is necessary to understand the importance of being eco-friendly in every facet of our lives, including dental practice which has a huge impact on the environment, which specifically emphasis the thrust to move towards 'Green dentistry'. Green dentistry is an innovative way of dental practice which is environment friendly and at the same time converses money and time by reducing waste, conserving energy and decreasing pollution with the use of latest techniques and procedures. Green dentistry therefore, protects the environment and mankind from the hazards of rapid urbanization in developing countries.

KEYWORDS: Green dentistry, Green, Dental waste, Environment pollution, Atmosphere.

INTRODUCTION

The color green has healing power and is understood to be the most restful and relaxing color. Green can help enhance vision, stability and endurance. Renewal, growth, and hope are related to this color and it indicates safety in the advertising of drugs and medical products. Green Dentistry is an approach to dentistry that combines dental practices and environment conservation.[1] 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.[1,2,3,4] It is a budding concept which is beneficial to the environment, the patient, clinic staff, and also to the dentist. It not only helps control the waste pollution in the dental practice but also saves water, energy, and other resources in the dental clinic.[3,4,5] The need of the hour for dentistry is for each dentist to rethink his every decision and action for environmental sustainability. Sustainability is the principle of meeting the needs of the present without compromising the ability of future generations to meet their own needs. Hence, it is the responsibility of every dentist to assess and monitor the impact of the dental byproducts on the environment.[3] To make eco-friendly dentistry a possibility, there are two main avenues for implementing change. These are (1) Appropriate policy development and implementation; and (2) dentists taking responsibility/ownership. In the absence of policies and regulations, dentists need to make an individual effort to do their part for a sustainable greener future.[3,6]

Need for Go Green Dentistry

The reasons for changing the current scenario of a dental practice into an eco-friendly dental practice are abundant, as a lot of practices followed in our clinic have a direct or an indirect detrimental effect on the environment.[2] They can be listed as follows:

a) Infrastructure of the clinic.
b) Use of traditional radiography producing hazardous by-products like waste fixer, lead foils.
c) Use of silver amalgam restorations.
d) Excessive use of disposables for infection control.
e) Use of chemical sterilization with toxic disinfectants.
f) Wastage of resources like electricity, water, paper, etc.
g) Improper disposal of bio-hazardous waste.

METHODS FOR GREEN DENTISTRY

1. Green Building and Dental Clinic: 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.[2] While designing an eco-friendly dental clinic, Linoleum flooring should be preferred.[3,5] Paint: Some of the most harmful chemicals found in the paint, which is commonly used for painting clinic walls are volatile organic compounds or VOCs. VOCs are unstable, carbon-containing compounds that readily vaporize into the air. As paint dries, these harmful VOCs are released into the air at high levels.[3] The VOC reductions made possible by technological advancements in the paint industry. Hence, use ultra-low VOC paint or zero VOC paint in clinics.[3,5,6,7] Lighting: Use compact fluorescent light bulbs in the clinic. They last 8 to 12 times larger than incadescents, at a quarter the cost per hour. They also produce 70% less heat than incadescents when illuminated.[2] It saves energy and have revolutionized energy-efficient lighting.[2,7,8] Wherever possible use the natural light by making large windows a part of your clinic décor.[3]

2. No Paper Dentistry: Going paperless is truly a new approach.3 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.[2] Using computers and other devices to maintain all records and digital patient communications helps not only save paper but also staff time.[3,7] Some softwares like ecoPrint Ink and Toner Saver are available that can reduce up to 75% of ink usage.[2.6]

3. 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.[2,7]

4. Digital Radiology: Traditional X-rays result in significant and pollution. Digital dental radiographs expose patients to 70 to 90% less radiation exposure than traditional X-rays.[2] With the use of digital X-rays, dental practices can dramatically reduce the harmful chemicals such as lead and silver from being released into the environment. Furthermore, patients are exposed to less radiation compared to traditional radiography. The added benefits are that the digital X-rays are of better quality, better accuracy, easily stored for records, and can be send anywhere across the world.[3] Digital images also require 75 to 90% less radiation than conventional images.[2,8]

5. Instruments and Materials: Need of purchasing environmentally friendly alternatives among dental materials for the care of the planet as well as the patient. Use of disposable towels, patient bibs, suction tubes, sterilization pouches, and instruments, etc. generates a lot of waste. Hence, dentists need to switch to reusable alternatives which can be sterilized.[3,8,9]

6. Maintain Amalgam Waste: 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, it contains mercury, silver and other metals that can enter the environment. Mercury is biocompatible and is known to have toxic effects in plants, animals and humans.[2,3,9] 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.[3] ISO certified amalgam seperators are able to reduce amalgam particles in dental waste water by more than 95%.These devices separate the fine particles from waste water, 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.[2,8,9,10]

7. 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.[2,10]

8. CAD/CAM Systems in Dental Clinic: 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.[2,11]

9. Infection control: Dental office infection control and sterilization processes can be a major source of pollution and waste in the traditional dental practice.[2] Chemical sterilants should be avoided whenever possible.[3,8] In the Eco-friendly practice, replace chemical based sterilization with steam sterilization. Toxic cold sterilization methods are eliminated.[2,11,12]

10. Accurate Waste Disposal: Dental clinics generate a number of biomedical wastes, including blood soaked materials and human tissues, expired drugs, syringes, broken glass, scalpels, specimen tubes, slides. The waste should be properly disposed using color coding of

waste categories. The plastic bags used for waste disposal are special non-chlorinated, which can be incinerated.[3,5,6,7]

11. Save Resources: The resources like energy, water, paper, etc., need to be used resourcefully. All the appliances should be switched off when not in use. Standby power or phantom load should be avoided. Low-flow aerators can be installed on all sink faucets to conserve water.[3,6]

12. Train the staff and patient education: For effective working of the dental clinic, each member of the dental team needs to play their part. The dentist needs to train his staff regarding all the environmentally friendly practices the clinic has accepted to follow. It is necessary to engage the entire dental healthcare team in any going green initiative.[3] Educate patient to adopt eco-friendly practices in their lives. Teach them to turn off the water while brushing teeth.[3,7]

13. 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, and Recycle.[2,3,4,5,6,7,8]

a. Reduce: Inorder to decrease the pressure on the earth's resources, people must decrease or reducetheir 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. Examples of dental office opportunities to reduce:

- Purchase often used items in bulk for, e.g. Prophy 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.

b. 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. 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.

c. **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. 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.

d. **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. Dentistry is a healing profession. Hence, being a part of the profession responsible for spreading smiles, it's time we stop overlooking sustainability and make our dental

practice eco-friendly; for a greener future. Being ‘green’ in dental practice will make one feel better about oneself and what we are doing for humankind.

REFERENCES

1. Rastogi V, Sharma R, Yadav L, Satpute P, Sharma V.Green dentistry, A metamorphosis towards an eco-friendly dentistry: A short communication. JCDR, 2014; 8(7): 1-2.
2. Avinash B, Avinash BS, Shivalinga BM, Jyothikiran S, Padmini MN. Going green with eco-friendly dentistry. J Contemp Dent Pract, 2013; 14(4): 766-69.
3. Chadha GM, Panchmal GS, Shenoy RP, Siddique S, Jodalli P. Establishing an eco-friendly dental practice: A review. IJSS Case Reports and Reviews, 2015; 1(11): 78-81.
4. Passi S, Bhalla S. Go green dentistry. J Educ Ethics Dent, 2012; 2(1): 10-12.
5. Fotedar S.Green dentistry: eco-friendly dentistry. Indian J Dent Adv, 2014; 6(4): 1703-1705.
6. Chopra A, Gupta N, Rao NC, Vashisth S.Eco-dentistry: The environment friendly dentstry. Saudi J Health Sci, 2014; 3(2): 61-65.
7. Goel V, Arora A, Nirola A, Awana M, Khurana P. Green dentistry “ways to go green at the dental office. SUJHS, 2015; 1(1): 39-40.
8. Hiltz M. The environmental impact of dentistry. JCDA, 2007; 73(1): 59-62.
9. Adams E.Eco-friendly dentistry: Not a matter of choice. JCDA, 2007; 73(7): 581-584.
10. Manzi J.Dentistry’s green future.www.dentaltown.com, 2019: 97-103.
11. Singh RD, Jurel AK, Tripathi S, Agarwal KK, Kumari R. Mercury and other biomedical waste management practices among dental practitioners in India. BioMed Res Int, 2014; 1-6.
12. Zavery P.Green pediatric dentistry. www.peninsukakidsdds.com 2010.