

Green Dentistry: An Eco-friendly Approach

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Abstract

Green Dentistry is an approach to dentistry that combines dental practice and environmental conservation. 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. There is overwhelming evidence of global climate changes, and dentistry has a definite impact on the planet's eco- system. Green dentistry indeed lessens supply tariffs by amalgamating trending innovations, and multiplies productivity by methodical time manipulation, reducing wastage and thereby intercepting pollution. Ultimately patients get benefitted by quality treatment with reduction in treatment costs. The going green movement, which is rapidly becoming a worldwide priority, seeks to address environmental contamination, waste and other critical environmental issues.

Key words: Green, Dentistry, Ecosystem, Recycling, Conservation, Environment

Clinical Significance: Green dentistry is an evolving approach to reduce the environmental impact from dental practice.

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Green Dentistry: An Eco-friendly Approach

Green Dentistry is an approach to dentistry that combines dental practices and environmental conservation. 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. Unfortunately, particular materials that are currently used include heavy metals as well as biomedical waste, which offer impending challenges to the environmental balance. The word green and eco-friendly signifies the use of an alternative source of energy, non-toxic material, renewability, efficient use of energy and fewer carbon footprints. Concentration on the factors thereby will promote dentistry as a non-contributory profession to environmental pollution.

WHAT IS GREEN DENTISTRY?

The ECO-DENTISTRY ASSOCIATION defines Green Dentistry as: "Green dentistry 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".

REASONS TO CHOOSE GREEN DENTISTRY

Reason 1: Green dentistry is safer for you

When compared to other dental treatments, green dentistry is actually safer, making patient safety a primary consideration. Radiation exposure is considerably reduced with digital x-rays. Any green dental treatment does not include mercury, a contentious chemical used in dental restorations.¹

Reason 2: Green dentistry is safer for the environment

Green dentistry is merely another step toward living in a greener world, with no film chemicals necessary for x-rays and far less paper wasted. Dentistry, like other businesses and industries that have jumped on board, may be beneficial to the environment.

Reason 3: Stronger, more natural restorations

Metal is never utilised in any dental restoration solutions since green dentistry avoids Mercury because of its disputed nature and potential danger. As a result, green dentists employ ceramic and composite restorations that blend in with the natural colour of the teeth.

Reason 4: Less chemicals and disposables

In a typical dental clinic, a large number of disposables and chemicals are used on a daily basis. While disposables are useful for maintaining sterility, it is preferable to avoid them because it produces less harmful waste. Green dentists, on the other hand, employ high-tech autoclaves and other non-hazardous sterilisation methods.

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

Green dentistry is far from a fad, with an increasing number of dental clinics adopting energy-efficient and patient-safe choices. For years to come, dentistry will follow in the footsteps of other businesses and industries that are looking for greener alternatives.²

BENEFITS OF GREEN DENTISTRY

1. Minimize dental waste and pollution
2. Step toward high-tech dentistry
3. Saves energy, water and money
4. Pillar to wellness and lifestyle

Ten ways that we can be a part of dentistry's green future by reducing waste and pollution:

Digital imaging instead of traditional method

Use of an amalgam separator

Use of hospital- grade, reusable sterilization items, and patient barriers free from plastic.

Reduce packaging waste by clubbing the orders, which in turn will reduce the shipping waste.³

Recycle and reuse the old hand instruments

Use nontoxic, biodegradable surface disinfectants and cleaners

Place bulk order of regularly used dental materials, which in turn costs cheaper too.

Use stainless steel reusable or compostable impression trays.

Disinfect the water lines regularly using biodegradable or enzymatic cleaners and never use chlorine bleach because it can release airborne Mercury.

Avoid the use of toxic cold sterilization solutions such as glutaraldehyde, which is a powerful lung and skin irritant.⁴

HERBS IN ENDODONTICS

In endodontics, trend of recent medicine to use biologic medication extracted

From natural plants is seen because of the cytotoxic reactions of the most of

The commercial intracanal medicaments and irrigants used and their inability

To eliminate bacteria from dentinal tubules.

Herbal Alternatives used as Irrigants in Endodontics are tea tree oil, ginger, clove, turmeric, garlic.

WASTE REDUCTION

The British Dental Association provides an advisory note on healthcare waste management as part of the legislative responsibility that dentists need to ensure that all healthcare waste is managed and disposed off properly.

Health professionals are on the leading edge of helping to heal our planet by introducing the four R's; Rethink, Reduce, Reuse, and Recycle.

Rethink:

The first step toward environmental sustainability is to rethink how dentist offices are conducted.⁵

Proper sun illumination and use florescent lighting

Promote indoor plantation

Inclined roof for water harvesting

Solar water heaters

Carpool to work with colleagues

Reduce:

The easiest way to have more of a resource is to use less of it.

Substitute autoclave wraps with sterilisable cassettes and plastic syringes with glass syringes

Use of biodegradable disposable cups

Steam sterilization over chemical sterilization

Use biodegradable or enzymatic cleaners instead of chlorine bleach for cleaning water lines

Proper disposal of amalgam

Dry Dental vacuum

LED lights with motion detectors

Re-Use:

To “re-use” is to use an item again after it is already used once. This manoeuvre boosts the extended use of an item; thus debarring the item from contributing to the waste in the landfills. Assigning a refreshing intent for an item prolongs its life and lessen the excess baggage on the landfills.

Recycle:

Recycling products is a viable way to reduce overall contamination of the environment. It is a crucial component of the management of waste hierarchy. Always segregate the waste and recycle.⁶

Use a sharps disposal service that recycles them into building materials

Exercise recycling bins in dental clinics

Instrument recycling program

Recycle x-rays fixer and developer solution and lead foil from x-rays 38

DENTAL WASTE DISPOSAL SYSTEM

The term Biomedical waste has been defined as “any waste that is generated during the diagnosis, treatment, or immunization of human beings or animals, or in the research activities pertaining to or in the production or testing of biological and includes categories mentioned in Schedule I of the Biomedical Waste (Management and Handling) rules 1998.”

COLOR CODING FOR BIOMEDICAL WASTE MANAGEMENT:

According to the new updated colour coding for Biomedical Waste Management– 2016, waste should be disposed in suitable colour bags as under:

1. Yellow: Collected in coloured non – chlorinated plastic bags or containers.

Human anatomical waste: Human tissues, body parts, organs.

Soiled waste: items contaminated with blood, plaster casts, cotton swabs, bag containing residual or discarded blood.

Expired or discarded medicines: pharmaceutical waste including ampoules and vials.

Chemical liquid waste: X-ray film developing liquid, disposed formalin, contaminated secretions, aspirated fluids, liquid from laboratories and floor washings.

Microbiology, Biotechnology and other laboratory waste: culture media, stocks or specimens of microorganisms, live or attenuated vaccines.

2. Red: Collected in red coloured non-chlorinated plastic bags or containers.

Polluted Waste resulting from use and throw articles such as tubes, bottles, intravenous tubes, catheters, urine bags, syringes etc.

3. White: Collected in puncture-proof, leak-proof and tamper-proof containers.

Needles, syringes having immovable needles, needles from tip cutter or burner, scalpels, blades, or any other infected needle-like object.

4. Blue: Collected in cardboard boxes with blue coloured markings.

Glassware: Broken or discarded and adulterated glass objects including medicine vials and ampoules except those contaminated with cytotoxic wastes.

Metallic body implants.

POLLUTION PREVENTION

Webster defines pollution as the contamination of air, soil, or water by the discharge of harmful substances.⁷

There are various steps that can be taken in the dental office to prevent pollution:

Steam sterilization – It is time efficient and reliable; eliminates toxic chemical sterilization vapours in the dental office environment. It also eliminates hazardous waste; allows for reusable sterilization warps.⁸

Use of digital radiography instead of traditional film- based x- rays. It eliminates toxic x- ray fixer solutions and lead foils. Along with this, it has other advantages such as instant image availability; improved image quality; enhanced diagnostic efficacy; minimal radiation exposure.⁹

Always use licensed handlers for offsite recycling of hazardous materials.

Dental amalgam:

HIGH TECH INNOVATION

Today's high- tech innovations make the practice of dentistry more reliable, easier, and more cost- effective. Almost all high- tech innovations in dentistry have some environmental benefits also, for example, computer- aided design/computer- aided manufacturing systems.¹⁰

The following similar high- tech innovations are part of dentistry's green future:

- Digital imaging
- Esthetic restorations eliminating the use of amalgam
- In- office sharps disposal equipment
- Steam sterilizers that eliminate the use of harmful chemicals
- Use of computers for the storage of patient records.¹¹
- Digital patient communications such as appointment reminders through E- mail reduce paper and saving staff time
- Diode lasers, which eliminate the need for retraction cords
- Use of a web site as a primary marketing tool
- Oil- free compressors.¹²

ADA SUGGESTIONS

The Council on Dental Practice of the American Dental Association has framed the top ten guidelines for starting up a green dental practice. These are:

1. Install an amalgam separator
2. Turn off equipment when not in use
3. Reuse paper craps
4. Use recycle bin and create a "green team" to bring items to recycle centres
5. Recycle shredded confidential patient information.¹³
6. Convert to digital technology
7. Install solar or tinted shades
8. Install locked or programmable thermostats
9. Install high- efficiency lighting
10. Use nontoxic cleaners and do not use too much disinfectant.¹⁴

COVID-19 AND ECO-FRIENDLY DENTISTRY

At the height of the pandemic's first wave, and when urgent care centres were popping up across the country, the British Dental Association created advice on how to stay safe in what was 'the new day' in the life of a dental team.¹⁵ In it, the advice read:

Getting to work

Wear clean clothes

Put your phone in a plastic bag

Pack two pillowcases and use a washable bag like a rucksack

At work

Change into clinical work wear

Put your home clothes into one pillowcase

Prior to clinical activity put on appropriate PPE, including doffing and donning procedures as appropriate.¹⁶

Leaving work

Shower if possible

Put your work clothes in the other pillowcase

Change into the clothes you had on in the morning.¹⁷

Arriving home

Clean down your car where your hands came into contact with it

Enter your home with minimal contact with the premises

Wipe down the door

Place the pillowcase with all work clothes in the washing machine

Machine wash all your clothes and pillowcases at 40° plus

Wipe down the machine.¹⁸

Fast forward to today and the opportunities to reduce plastic consumption, PPE waste, reuse, recycle and improve the carbon footprint associated with the profession is in exactly the same place.¹⁹ Enhanced levels of personal protective equipment (PPE) are still required for aerosol generating procedures (AGPs), single-use

plastic is still very much front and centre and as for carbon footprint, both patient and staff attitudes to using public transport have torpedoed any progress the profession saw in the build-up to 2020.

Conclusion

Green dentistry is an evolving approach to reduce the environmental impact from dental practice. There is overwhelming evidence of global climate changes, and dentistry has a definite impact on the planet's eco- system. Green dentistry indeed lessens supply tariffs by amalgamating trending innovations, and multiplies productivity by methodical time manipulation, reducing wastage and thereby intercepting pollution. Ultimately patients get benefitted by quality treatment with reduction in treatment costs. The going green movement, which is rapidly becoming a worldwide priority, seeks to address environmental contamination, waste, and other critical environmental issues.

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