

Eco-Friendly Dental Care

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Introduction

Environmental awareness regarding resource use and emissions over product lifecycles has been growing in recent years. In today's world, it is crucial to recognize the value of living sustainably in all aspects of our lives. This has translated into a global movement leading to green transformations seeking to improve the health of the ecosystem by conserving resources and minimizing detrimental impacts .

Dental caries is one of the most prevalent chronic diseases representing a great challenge for oral health care from time immemorial. Dentistry is most crucially and foremost a healing profession. Green dentistry, or eco-friendly dentistry is currently transforming the dental field to reduce its effect on our natural environment and decrease the amount of waste being produced. New strategies that follow the 'green' recommendations including conservative resources and sustainable approach were implemented to encourage both dentists and patients to become leading stewards of the environment.

Dentists should take a leading role in the society by implementing 'green' initiatives to provide optimal oral health services, maintain patient safety, reduce their impact on natural resources as well as provide social value to the communities they are rooted in. A growing number of people are interested in biologically active substances that are generated from natural sources and may one day be used therapeutically in dentistry.

Human impact on the Environment

The effects of overpopulation are quite severe, resulting in severely damaged ecosystems. 91-99% of the world's population lives in places where air quality exceeds WHO guidelines The rubbish we globally generate is enough to fill 63,000 waste removal trucks. Moreover, 5.25 trillion pieces of plastic debris in the ocean . Thus, pollution growth and increasing consumption, tend to increase emissions of Greenhouse gases causing climate changes, threats to ecosystem and biodiversity.

Eco-friendly / Green Dentistry

Green dentistry is a new upcoming high-tech emerging trend in dentistry moving towards an ecologically sustainable health care system. It reduces the environmental impact of dentistry and creates a caring environment for patients. Eco-friendly signifies the use of alternative sources to reduce carbon footprints. However, lack of enough knowledge was the prime factor that influenced the adoption of green dentistry.



Oral health and Climate change

The impact of oral health goes beyond a personal manifestation on the individual, with environmental consequences throughout life. In 2014-2015, the carbon footprint of dentistry was calculated to be 675 kilotons carbon dioxide equivalents (CO₂e) . However, 2/3 of emissions related to travel of patient and staff, while waste accounts only 0.2%.



Eco-Friendly Dental Profession Measures

The four Rs- reduce, reuse, recycle and rethink are essential pillars in guiding dental office toward environmental responsibility.

1. Design dental office with thermal efficacy, energy saving, oxygenation and air purifiers.
2. Electronic patient charting , registration and caries risk assessment.
3. Switch to Reusables Over Disposables tools.
4. Medical & Biomedical waste should be segregated into containers to facilitates the process of reuse and recycling.
5. Natural phytochemicals hold enormous potential as adjunctive therapeutic agents in the prevention and control of dental caries
6. High-tech innovations are key to achieve targets for waste reduction and resource conservation.

Eco-Friendly Individual-Active Measures

Choose whatever step is easier for you because embracing a more eco-friendly oral care is not happening overnight.

1. Eco-friendly toothbrush made of sustainable materials such as Bamboo, Cornstarch, Wheat straw or Recycled plastic.
2. Sustainable toothpaste packaging design with durable cardboard tube and material bio-esters derived cap.
3. Natural extract toothpastes have the ability to clean your teeth gently and effectively while fighting bacteria
4. Toothpaste tablets are also eco-friendly containing coconut oil, baking soda, aloe vera, xylitol and nano-hydroxyapatite.
5. Turn off water while brushing your teeth to save 90 glasses of water/ day/ person.
6. Use herbal mouthwashes prepared with extracts and essential oils with additional anti-inflammatory and antioxidant properties.
7. ECO floss made from Bamboo Charcoal Fiber with recyclable or biodegradable packaging.
8. Switching to an Eco-Friendlier diet can cut down on the risk of tooth decay, as well as your environmental footprint



Eco-Friendly Community Active Measures

All community-level caries prevention programs have an associated environmental cost.

1. Water fluoridation had the lowest environmental impact
2. Supervised toothbrushing had a lower environmental impact
3. Fluoride varnish application while a child is at routine recall is the most sustainable way to deliver FV

Recommendations

1. Workshops, seminars, and conferences must be conducted .
2. Include the concept of green dentistry in teaching curriculum.
3. Monitoring organizations to evaluate the implementation of the concept.
4. Promoting research works on the concept.

References

1. Ashley, Paul, et al. "The Environmental Impact of Community Caries Prevention - Part 2: Toothbrushing Programmes." *British Dental Journal*, vol. 233, no. 4, 26 Aug. 2022, pp. 295–302., doi:10.1038/s41415-022-4905-3.
2. Braga, Aline Silva, et al. "The Effect of Toothpastes Containing Natural Extracts on Bacterial Species of a Microcosm Biofilm and on Enamel Caries Development." *Antibiotics*, vol. 11, no. 3, 2022, doi:10.3390/antibiotics11030414.
3. Cai, He, et al. "Effects of Herbal Mouthwashes on Plaque and Inflammation Control for Patients with Gingivitis: A Systematic Review and Meta-Analysis of Randomized Controlled Trials." *Evidence-Based Complementary and Alternative Medicine*, vol. 2020, 2020, pp. 1–16., doi:10.1155/2020/2829854.
4. Duane, Brett, et al. "The Environmental Impact of Community Caries Prevention - Part 3: Water Fluoridation." *British Dental Journal*, vol. 233, no. 4, 26 Aug. 2022, pp. 303–307., doi:10.1038/s41415-022-4251-5.
5. "Eco-Friendly Dentistry: A Green Business with Teeth." *ResearchGate*, 2016, www.researchgate.net/publication/341930399_Ec-Friendly_Dentistry_A_Green_Business_with_Teeth.
6. Gupta, Ruchi, et al. "Green Dentistry: An Eco-Friendly Approach." *IOSR Journal of Dental and Medical Sciences*, Jan. 2022, mail.iosrjournals.org/iosr-jdms/papers/Vol21-issue1/Ser-12/H2101124549.pdf.
7. Janakiram, Chandrashekar, et al. "Effectiveness of Herbal Oral Care Products in Reducing Dental Plaque & Gingivitis – A Systematic Review and Meta-Analysis." *BMC Complementary Medicine and Therapies*, vol. 20, no. 1, 2020, doi:10.1186/s12906-020-2812-1.
8. Lyne, Alexandra, et al. "The Environmental Impact of Community Caries Prevention - Part 1: Fluoride Varnish Application." *British Dental Journal*, vol. 233, no. 4, 26 Aug. 2022, pp. 287–294., doi:10.1038/s41415-022-4901-7.
9. Mittal, Reena, et al. "Eco-Friendly Dentistry: Preventing Pollution to Promoting Sustainability." *Indian Journal of Dental Sciences*, vol. 12, no. 4, 2020, pp. 251–257., doi:10.4103/ijds.ijds_12_20.
10. Mulimani, P. "Green Dentistry: The Art and Science of Sustainable Practice." *British Dental Journal*, vol. 222, no. 12, 2017, pp. 954–961., doi:10.1038/sj.bdj.2017.546.