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Editorial

Green Prosthodontics: Need of the hour

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1. Introduction

Dental care, like the rest of the healthcare industry, needs to understand its role in sustainability as the globe struggles with the effects of climate change and environmental degradation. The field of Prosthodontics, which deals with replacing and restoring lost teeth, has historically dependant on methods and materials that, although efficient, frequently lead to waste production and environmental contamination. As eco-friendly techniques become more and more important in various businesses, "Green Prosthodontics" has become a need rather than a choice.

Green Prosthodontics is the term used to describe the use of sustainable methods in prosthetic dentistry, such as the use of digital technologies, biocompatible materials and effective waste management systems. It places a strong emphasis on lowering the negative environmental effects of dental procedures while upholding the highest standards of patient care. This editorial explores the significance, challenges and future directions of Green Prosthodontics in modern dentistry.^{1,2}

2. The Environmental Impact of Traditional Prosthodontics

Many of the synthetic materials used in Prosthodontics are non-biodegradable, including metals, ceramics, acrylic resins and polymers. Procedures like casting, milling, and sintering are used in the production of dental prosthesis; these operations use a lot of energy and produce chemical waste. Furthermore, dental clinics and labs generate a significant amount of single-use plastic trash, such as packaging materials, gloves, and impression trays.

Mercury is used in dental amalgams, which has raised concerns about its environmental toxicity.³ Despite a sharp decline in their use in specialty, some hazardous compounds, such as monomers from resin-based materials and casting alloys containing nickel and beryllium, nevertheless pose risks to the environment and industrial settings. The environmental burden is increased by the disposal of dental models and prosthesis as many of them do not decompose and end up in landfills.⁴

3. Sustainable Alternatives in Prosthodontics⁵⁻¹⁰

Several eco-friendly procedures and sustainable substitutes can be incorporated into Prosthodontics to reduce these environmental issues:

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3.1. Utilizing biocompatible and biodegradable materials

The use of materials like ceramic-based composites and bioresorbable polymers lessens dependence on artificial, non-biodegradable materials. To reduce landfill waste, research is being done to create biodegradable denture bases.

3.2. CAD/CAM Technology and digital dentistry

Traditional alginate and silicone impressions are no longer necessary with the advent of digital imprints made with intraoral scanners, which reduces material waste. Compared to traditional fabrication methods, CAD/CAM reduces errors and material waste. It also eliminates the need for physical storage, which reduces the waste of paper and models.

3.3. Eco-Friendly manufacturing and recycling practices

Developing recycling programs for dental materials, such as metal crowns, ceramics and plastics, can further improve sustainability. Using recyclable metals and alloys in sustainable casting procedures can lessen the environmental impact of mining and metal extraction.

3.4. Energy-efficient dental laboratories

Electricity usage in dental offices and labs can be decreased by converting to LED lighting and energy-efficient equipment. Using solar-powered dental equipment and facilities can help reduce carbon emissions considerably.

3.5. Reducing single-use plastics and green procurement

Adopting green procurement practices that provide preference to vendors providing sustainable dental products; promoting the use of reusable or biodegradable substitutes for impression trays, gloves and packaging materials.

4. Challenges in Implementing Green Prosthodontics

Green Prosthodontics has several potential benefits, but a number of obstacles prevent its widespread use:

4.1. High initial costs

Although eco-friendly materials and digital dentistry have long-term advantages, many dental clinics may find their initial expenses prohibitive, particularly in developing nations.

4.2. Limited awareness and training

A large number of dentists are either ignorant of sustainable alternatives or do not have the requisite training to successfully use digital workflows.

4.3. Regulatory restrictions

The introduction of novel, environmentally friendly dental materials in clinical practice may be delayed by the drawn-out and difficult regulatory process.

4.4. Technological limitations

Not all Prosthodontic operations can be entirely digitalized, despite the fact that CAD/CAM technology is developing quickly.

5. The Future of Green Prosthodontics

Green Prosthodontics is expected to become a crucial component of contemporary dentistry practice as the movement for sustainability in healthcare gains traction. . Several strategies can help accelerate its adoption:

5.1. Including sustainability in dental education

The curriculum of dental schools and training programs has to include sustainability in order to educate the aspiring Prosthodontists about environmentally friendly options.

5.2. Support from the Government and policy

Regulatory agencies ought to promote the use of environmentally friendly dental supplies and offer financial incentives to dental offices that implement green procedures.

5.3. Industry cooperation

To produce sustainable, reasonably priced materials and technologies, dental manufacturers need to spend money on research and development.

5.4. Public awareness and demand

Clinics may implement sustainable practices as a result of growing demand for green dental services from patients who are more concerned about the environment.

6. Conclusion

Green Prosthodontics is not just a trend but a necessity for a sustainable future in dentistry. Prosthodontists can help save the environment without sacrificing patient care by using eco-friendly procedures, biodegradable materials and digital dentistry. Despite the obstacles, significant change can be sparked by the combined efforts of patients, dental

professionals, legislators and business executives. In order to provide dental healthcare that is both efficient and ecologically conscious, Prosthodontics must develop to meet global sustainability targets as we progress toward a greener future.

7. Conflict of Interest

None.

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