

Dentistry's *Green* Future

by Ina Pockrass
co-founder, the Eco-Dentistry Association

What is green dentistry?

Green dentistry is a whole-earth approach to tooth care that reduces the environmental impact of dentistry and creates a caring environment for patients.

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What do the Gulf oil disaster, floods in Pakistan and scorching heat in Russia have to do with dentistry? When you have a two-hour hole in your schedule tomorrow, it's easy to say, "They don't have anything in common with dentistry," turn the other way and head back to the crown prep waiting for you in Op 2. But stop for a moment and look honestly inside yourself – somewhere, you know that our planet's bounty is limited, and that we as humans better do something about environmental degradation quickly, before our own survival is imperiled.

Dentistry is first and foremost a healing profession. We're in this to help people enjoy chewing and absorbing the nutrients in food, flash a winning smile, and be at ease kissing a loved one. Yet unbeknownst to most dentists, our practices contribute significantly to the Earth's heavy load. It doesn't have to be this way.

We must come to grips with the fact that the waste that *leaves* our practices doesn't go *away*. We all inhabit this one little blue planet, and we must consider future generations when we make choices for our dental practices and our lives.

By embracing abundant high technology and good old common sense, we can be part of dentistry's clean, green and highly profitable future. Here's how:

Reduce Waste and Prevent Pollution

By reducing waste and pollution on the front end, there is less to deal with on the back end. If you've converted to digital imaging, you've set up the foundation for a high-tech green dental practice and you don't have to deal with the disposal of lead foils and toxic X-ray fixer from conventional X-rays. While most dentists delegate waste compliance to a team member, many don't realize that the dentist remains personally responsible for proper hazardous waste disposal through the life cycle of that waste. The best way to eliminate liability for toxic waste is to not create it in the first place.

Statistics on the penetration of digital imaging in U.S. dental offices are between 25 and 33 percent. Good, but that also means that between 66 and 75 percent of the 120,000 U.S. dental offices still use traditional X-rays. These practices require disposal of 4.8 million lead foils and 28 million liters of X-ray fixer *every year*.¹

Interestingly, about the same percentages (between 25 and 33 percent) of dental offices have installed amalgam separators. Ask the 50 percent of dentists who self-identify as mercury-free, and you'll find a large number don't have a separator and believe

Green Dental Office Profiles

Joseph Manzi, DDS Eastchester, New York

1. What was the easiest aspect of going green?

Being a "startup" practice made it much easier to incorporate the principles of a "green" practice. The direction I received as a member of the Eco-Dentistry Association helped greatly in achieving the goals for a healthier practice.

2. What was the most unexpected benefit of being a green dental office?

I have been impressed with all the ways going paperless has improved staff efficiency. The digital communications aspect of paperless charting has streamlined communications with patients and specialists. The ability to diagnose X-rays immediately is a great benefit - patients aren't anxiously sitting around. The speed with which my staff can process insurance claims and pre-authorizations means they are more productive. I have also found my green office attracts a higher caliber of employee who is looking for an efficient, state-of-the-art practice where they can be at the top of their game.

3. How have your patients responded to you having a green dental office?

Very positively! Many of my current patients are from my previous location, and they love the changes I've made. A patient's first impression of the office creates confidence in the practice. Being green leaves a strong positive impression that the office is on the cutting edge and looking to the future.

4. If there was one thing you could tell your colleagues to do to go green, what would it be?

My colleagues must convince themselves of the importance of going green and how it will help to improve our environment. Then take the first step and contact the Eco-Dentistry Association for guidance and review their checklist.

5. Why would you say dentistry's future is green?

As dentists, and as professionals, we all accept the responsibility of being notable in our communities. We are respected leaders. A green dental office reinforces that image and sets an example for others to follow in their own lives.



they don't need one, because they no longer place amalgam. Wrong. Whether you put the material in or take it out, you should have a separator. The Environmental Protection Agency (EPA) estimates at least 3.7 tons, or 7,400 pounds (annually) of dentist-generated, mercury-containing waste ends up burdening our local wastewater treatment plants, is incinerated with other trash, poisons our air, or finds its way into fertilizer used to grow our food. The ADA is on board with separators, having signed an agreement with the EPA supporting separator use in every dental office generating amalgam waste.

Another big contributor to dental office waste is single-use, disposable patient barriers and sterilization methods. These might seem cheaper and safer in the short run, but the opposite is true in the long run. Reusable cloth methods have been used in this country's best hospital operatory rooms for decades, cost-effectively protecting practitioners and patients, while keeping millions of pounds of trash out of our overburdened landfills.

Dentistry's disposable methods account for a staggering amount of waste each year – the dumping of 1.7 billion sterilization pouches and 680 million patient barriers. The bulk

of this trash comes from covering everything in reams of plastic – plastic that comes from scarce and ever-harder-to-find oil (think of the Gulf of Mexico) – barriers that are thrown out after each patient. If you're still using disposable barriers, take two minutes at the end of the day to examine the amount of trash your office has to get rid of in a day. The dental office of the future utilizes hospital-tested reusable methods, combined with effective, planet-safe surface disinfectants, generating about 90 percent *less* trash.

Here are 10 ways that you can be part of dentistry's green future by reducing waste and pollution:

1. Use digital imaging.
2. Install an amalgam separator and ensure that your waste is properly recycled, not dumped in somebody else's backyard.
3. Use hospital-grade, reusable sterilization items and patient barriers free from plastic.
4. Tell your dental supplier to reduce its packaging and to combine your orders to reduce shipping waste.
5. Recycle old hand instruments, giving them new life as car bumpers or other metal items.

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Dr. Phillip Moorad Aesthetic Dental Health Avondale, Arizona

1. What was the easiest aspect of "going green"?

Transitioning to green was simple and created no down time for our office treating our clients.

2. What was the most unexpected benefit of being a green dental office?

Our office feels much cleaner now that we've gotten rid of disposables. There is less clutter and it appears more organized.

3. How have your patients responded to your green dental office?

Dental patients are very observant. Our patients have noticed the subtle changes we've made and appreciate our dedication to be more eco-friendly. That perception of our dedication translates to how they perceive our care for their dental wellness. They feel we are a more responsible dental office in every aspect. Our patients tell us how happy they are we have decided to make the change.

4. If there were just one thing you'd tell your colleagues to do to "go green," what would it be?

Get rid of that old X-ray film developing system and go digital. This is a prime example of how to be more cost-effective and efficient while reducing waste and pollution.



5. Why would you say dentistry's future is green?

It just makes sense. You can become more profitable, reduce your carbon footprint, decrease toxic waste in your community, and patients love it. Green dental offices deliver a safe, high-quality service and maintain or exceed OSHA standards. When you know the problem, you become more aware and can visualize what you need to change. It's important for dentists to recognize the impact of our business practices, and to envision a clean, green future.



6. Use nontoxic, biodegradable, approved surface disinfectants and cleaners.
7. Buy whatever you can in bulk; e.g., prophy paste and impression materials – it's cheaper, too!
8. Use reusable stainless steel or compostable impression trays.
9. Clean your water lines regularly, using biodegradable or enzymatic cleaners, never chlorine bleach, which can release airborne mercury into your office.
10. Eliminate toxic cold sterilization solutions, like those containing glutaraldehyde, a powerful lung and skin irritant.

Save Energy, Water and Money

Conservation is a critical piece of dentistry's green future. It is the mantra of green dentistry because it extends the life of our precious resources and keeps more money in our bank accounts.

Many energy-saving modalities don't require you to purchase anything; all you have to do is stop wasting the energy for which you pay but don't use. The next time you are ready to leave your office, scan each operatory and business area and look for those ubiquitous blinking lights emanating from elec-

trical equipment. Chances are there are computers, intraoral cameras, televisions, and lights left on when no one is in the office. By turning off these items every time the office is closed, you'll reduce your "phantom load," the energy drawn by an item that is plugged into the grid, but not in use. Watch your electric bill decrease!

An exciting development in green dentistry's future is the recent introduction of energy- and water-saving dental equipment. Take LED operatory lights, which can reduce electrical energy consumption by 70 percent, eliminating the need for expensive halogen bulbs, and allowing for easier placement of composite restorations.

Several manufacturers have engineered waterless vacuum systems, which save about 360 gallons of water per day, per dental office – enough to fill an average-sized hot tub every day. If every U.S. dental office installed one of these waterless systems, we could collectively conserve as many as nine billion gallons of clean, drinkable water a year – water we are now literally pouring down the drain. That's equivalent to saving enough water to fill 15,000 Olympic-sized swimming pools every year. Stop and think about how we take water for granted, how dependent



Dr. Steve Green Team Green Dentistry Fishers, Indiana

1. What was the easiest aspect of "going green"?

Knowing it's the right thing to do – after hearing Tom Friedman speak in 2009, I felt it was not only the right thing to do, but it's also patriotic.

2. What was the most unexpected benefit of being a green dental office?

I thought going green would cost more. I was surprised to find the expense was neutral at worst. I've also seen time savings and have eliminated the purchase of some unnecessary products altogether.

3. How have your patients responded to your green dental office?

Very positively – I think people are very comfortable with being eco-friendly and are quick to join in.

4. If there were just one thing you'd tell your colleagues to do to "go green," what would it be?

Eliminate disposables. Sterilize and re-use instead to reduce waste and save money. Before disposables came along, we sterilized and re-used.

5. Why would you say dentistry's future is green?

Dentistry has a history of being focused on prevention. This should be no different. We have opportunities to reduce our effect on our communities and prevent the damage done by wasteful and polluting methods. As health educators, we can use the regular contact with our patients to educate them about environmental issues, too.



Photography by Stromberg Photography

modern dentistry is on reliable access to clean water, and how one out of every six people on the planet already lives without safe drinking water.

Now think about how green dentistry can put more “green” in your pocket. To get the facts, the Eco-Dentistry Association retained a respected consulting firm, Natural Logic, to analyze green dental innovations and determine whether each costs or saves money, and the rate of return on investment.

The data showed that by veering toward green practices dentists can improve their bottom lines by as much as \$50,000 a year. Energy-efficient lighting saves the average dental practice more than \$600 a year on energy expenses, while steam sterilizers save more than \$800 a year, from both energy and chemical purchase savings. Switching to cloth infection control and sterilization methods can put as much as \$2,300 in annual savings into the dentist's pocket. While digital imaging has a significant up-front cost, once installed, it saves almost \$9,000 a year, and you begin realizing a return on investment in just six months. Tooth-colored restorations increase practice revenues by as much as \$37,000 a year, because more technique-sensitive materials command a higher billing rate.

Here are 10 energy, water and money savers that are part of dentistry's green future:

1. Look for Energy Star-rated printers, computers, dishwashers and the like.
2. Convert to LED operatory lights.
3. Install an in-office water distiller.
4. Assign a team member to ensure that everything with an on-off switch is powered off at night.
5. Convert to a waterless vacuum system.
6. Install LED “Exit” signs and other emergency indicators.
7. Use tooth-colored restorative materials.
8. Join the EDA's “Save 90 a Day!” Campaign, where dental professionals ask patients to turn off the water when they brush their teeth, saving 90 glasses of water per day, per person.
9. Use CDC-compliant, waterless hand sanitizers.
10. Install motion sensors to automatically turn off lights when people leave nonmedical areas like business offices, supply closets, and staff lunch rooms.

Green Dentistry is High-Tech Dentistry

It was only about 50 years ago that dentistry was revolutionized by air turbine-driven handpieces and low-risk local anesthetics. Since then, the technology revolution has escalated, with new innovations appearing every few years, not every 50. We know this trend will continue, and high-tech innovations will continue to make the practice of

dentistry more reliable, easier on practitioners, and more cost-effective.

It turns out that almost every high-tech innovation in dentistry also has environmental benefits. Take CAD/CAM systems. Yes, there is the chair-time advantage of single-visit restorations, but consider that single visits by patients mean lower carbon emissions because the patient's travel to your office is reduced by half. Consider also that CAD/CAM systems eliminate the need for disposable impression materials, and the freight and transportation impacts associated with sending restorations back and forth to a lab.

Here are 10 high-tech innovations that are part of dentistry's green future:

1. Digital imaging (yes, we know it's here twice, but it bears repeating)
2. CAD/CAM systems
3. In-office sharps disposal equipment that renders sharps inert
4. Steam sterilizers that eliminate use of chemicals
5. Digital patient charting, scheduling and billing

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EDA Best Practices

Many high-tech offices find they have already implemented big-impact green initiatives, such as digital imaging and an amalgam separator. Protocols for infection control and sterilization is the third in the “big three” of greening your dental office processes and procedures. Implementing greener infection control practices can save your office thousands of dollars a year by reducing single-use items and eliminating the cost of chemicals.

It's a common misperception that proper infection control demands wasteful and polluting practices. The Eco-Dentistry Association works closely with infection control industry experts, such as Dr. John Molinari, and follows the guidelines outlined by OSAP in making recommendations for infection control and sterilization procedures. We encourage dental teams as a whole, back office and front, to be familiar with the products and protocols your office uses for these important dental office procedures. The following is a summary of the *EDA Best Practices for Waste Reduction and Pollution Prevention in Infection Control* and *EDA Best Practices for Waste Reduction and Pollution Prevention in Sterilization*, available on the EDA's Web site. The EDA's guidelines aren't meant as a comprehensive infection control manual, but provide direction for dental offices in how to implement available eco-friendly alternatives.

Eco-friendly infection control and sterilization must:

- meet the highest infection control and sterilization standards.
- eliminate the use of toxic chemicals.
- reduce landfill waste and air and water pollution.

Tips for Implementing a Greener Practice:

- Check for glutaraldehyde or a mix of formaldehyde and ether in your disinfectants and sterilizing solutions. Avoid these ingredients, as they've been linked to lung and skin irritations, affect indoor air quality, and are hazardous to the environment when disposed of improperly.
- Choose steam sterilization to improve indoor air quality, increase efficiency, and eliminate the cost of sterilization chemicals.
- Choose re-usable sterilization pouches and wraps that are made of fabrics specifically designed to both allow penetration of steam and act as a barrier to maintain the sterility of items inside under typical dental office storage conditions.
- Always use an internal and external indicator when processing instruments.
- Be sure to choose re-usable sterilization wrappers or pouches that have proper FDA registration and are made with low-lint fabrics that will not damage sterilization equipment.
- Regularly clean ultrasonic lines with a nontoxic, biodegradable solution.
- Never use chlorine bleach to clean ultrasonic lines, as the bleach releases harmful substances (e.g., mercury-containing dental waste) into the water supply.
- Purchase gloves and masks in bulk, and choose brands that come in recycled boxes printed with eco-friendly inks.
- Look for supply companies that offset their carbon.
- Choose cloth lab coats or washable drapes rather than virgin paper, disposable lab coats.
- When washing hands is the correct choice, turn off the tap during lathering to avoid wasting clean drinking water. Dry your hands with a reusable towel (not the hanging or roll type), or with paper towels made from recycled or FSC-certified paper.
- When appropriate, use hand sanitizer to disinfect your hands.
- Clean and disinfect clinical surfaces using an eco-friendly cleaning and disinfecting wipe, according to manufacturer instructions. If your eco-friendly disinfectant is not in a wipe form, use the "spray, wipe, spray, wait" method.
- When a barrier is needed or preferred, choose re-usable cloth barriers.
- Choose a biodegradable, nontoxic disinfectant that the FDA has determined is "generally regarded as safe" (GRAS), and effective against mycobacterium TB, salmonella, e. coli, staphylococcus aureus (MRSA), hepatitis, HIV, H1N1 and influenza.
- Wash cloth infection control barriers in an on-site eco-friendly washing machine, or send them out to a hospital laundry service.
- For more information about these recommendations, including cloth infection control and sterilization methods and the use of eco-friendly disinfectants, see the full Best Practices at www.ecodentistry.org.
- Hire an OSHA consultant to properly train employees and conduct regular on-site inspections to ensure your office is consistently compliant with all regulatory requirements.

6. Digital patient communications, like e-mail appointment reminders, reducing paper and saving staff time
7. Diode lasers, which eliminate the need for packing cords
8. Use of a Web site as a primary marketing tool
9. Electronic media (e.g., iPad) to record patient intake forms
10. Oil-free compressors

Green Dentistry is Wellness-based Dentistry

Every branch of medicine is moving from a disease-based model to a wellness-based model – one that is centered upon prevention, early detection, and less-invasive treatments. Dentistry's green future embraces this wellness-based model because our profession is literally on the front lines of total body wellness – we know now that a healthy mouth is the cornerstone of a healthy person.



Client lounge at Transcendentist, the office of D. Fred Pockrass in Berkeley, California.

Practicing wellness-based dentistry allows you to reach a burgeoning market of dental consumers, specifically the 25 to 33 percent of Americans who are values-based consumers using an environmental and wellness-based litmus test to guide their purchases. In 2007, these consumers, the majority of whom are women, spent more than \$200 billion on goods and services that matched their values. Tap into this market and you'll tap into people who become evangelists for your practice, reducing external marketing costs and bringing high-quality patients more willingly and frequently into your chair.

Here are 10 wellness-based modalities that are part of dentistry's green future:

1. Laser diagnostic tools that allow you to see caries earlier than with the naked eye
2. Oral cancer diagnostics
3. Salivary testing to determine genetic predisposition to periodontal disease and identify pathogenic bacteria
4. Laser treatment of periodontal disease
5. Aroma therapy, to help dental patients relax naturally
6. Homeopathic modalities like Arnica, which promote reduced swelling and bruising after dental procedures, with no drug interaction
7. Hand or foot massage to relax patients

8. Live, green plants in the operatory, increasing oxygenation
9. HEPA UV germicidal, in-operatory air purifiers to remove particulates from the air
10. Nutritional supplements like CoQ10, which are proven to support periodontal health

Conclusion

Seize the day and become part of dentistry's clean, green and profitable future. Start wherever you are and do something. The planet, your patients and your bottom line will thank you. ■

i Data from the Eco-Dentistry Association

Author's Bio

Ina Pockrass is the visionary leader of the green dentistry movement. She has been honored as one of the Top 25 Women in Dentistry, and is an attorney and marketing expert. Ina co-created the country's first green dental office in 2003, designed and brought to market the Transcendentist brand of professional green dental products in 2007 (now distributed by Discus Dental), and co-founded the Eco-Dentistry Association in 2008. She writes and speaks internationally about green dentistry.



Green Dentistry Industry Leaders

DentalEZ

"DentalEZ has long considered the dental team and patients' health and comfort in the development of our products. As we move into the future, we recognize the need to develop products that also protect the health of today's environmental resources. That is why DentalEZ remains committed to developing products that provide an ergonomic, efficient and eco-friendly environment for the dental practice."

– Randy Arner, vice president, marketing, DentalEZ

Eco-Friendly Products:

- everLight LED Operatory Light
- Bison and Bulldog Dry Vacuum Pumps
- CustomAir Water Ring Pumps with Water Recirculator
- CustomAir by RAMVAC LubeFree Compressor
- RAMVAC Slugbuster Line Cleaner
- StarDental StarBright Fiber Optic System
- SolmeteX Amalgam Separator
- StarDental Lube-Free High-Speed Handpieces



Discus Dental & Transcendentist Green Dentistry

"We're very pleased to partner with Transcendentist to help transform dentistry by bringing multiple lines of sustainable dental products to market quickly. We know that green dental products are not only better for the environment, [but] can help reduce overall supply costs."

– Steve Semmelmayr, CEO, Discus Dental

Eco-Friendly Products:

- Re-usable infection control barriers: patient bib, headrest cover, light handle cover
- Re-usable sterilization pouches and wraps
- Joysence aromatherapy products for dental offices: hand sanitizer, lotion, liquid soap, room spritz



Hu-Friedy

"Hu-Friedy has a strong cultural commitment to bringing products and programs to market that help dental professionals in an environmentally responsible way. Our Envirodent program, which is the longest-running instrument recycling program in our industry, just celebrated its 15-year anniversary, and we are gratified to see the enthusiastic response from the dental community regarding recent program enhancements."

– Ron Saslow, president and CEO, Hu-Friedy

Eco-Friendly Products:

- Envirodent instrument recycling program
- Team Vista water line cleaner

