

# Going green in dermatology



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**Key words:** carbon emissions; climate change; eco-friendly dermatology; environmental impact; green health care; Mohs micrographic surgery; sustainability; sustainable practices; waste reduction.

Climate change is real and is relevant to dermatology. In a survey-based study of 148 dermatologists, most felt responsible for educating patients (77.2% ± 6.7%), peers (84.6% ± 0.8%), and policymakers (88.6% ± 5.1%) on climate change, whereas a smaller proportion reported that they would feel comfortable discussing this topic (37.2% ± 7.8%).<sup>1</sup> Dermatologists could evaluate their contributions to carbon emissions, be informed about the impact of climate change on the skin, educate patients, and advocate for policy changes to protect public health. This letter describes the benefits to dermatologists of going green and how it may reduce practice costs and save the environment in the long term.

Implementing environmentally sustainable practices in dermatology can significantly reduce waste and carbon emissions while offering cost-saving benefits (Fig 1). A single-center study of 26 Mohs micrographic surgeries reported 43.1 kg of combined waste, extrapolating to 323.25 kg of waste production and 25.75 kg of CO<sub>2</sub> production per year for one practicing Mohs micrographic surgeon. Introducing standardized Mohs micrographic surgery sets effectively minimizes waste without compromising clinical outcomes, reduces environmental impact, and saves costs (Fig 1, Table I).<sup>2</sup> In addition, a quality improvement study providing climate change educational materials, combined with waste audits, reduced the mean number of wasted supplies in skin biopsy kits from 10.1 (SD, 3.4) to 1.6 (SD, 1.3) (*P* values not reported).<sup>3</sup> Similarly, a systematic review and meta-analysis of

life-cycle assessments measuring the environmental impact of products throughout production, use, and disposal showed that transitioning from single-use to reusable health care products significantly reduced greenhouse gas emissions and global warming potential from 38% to 56%. Furthermore, replacing disposable biopsy punches with autoclavable versions minimizes emissions and waste.<sup>4</sup>

We are amid an environmental crisis plagued by climate change, pollution, and biodiversity loss – all of which can be directly traced back to human actions and consequences. The effects of climate change on human health have been well established and correlate with increased distribution and frequency of dermatological conditions. We, as dermatologists, call on government officials and policymakers to recognize climate change as a public health emergency and take sufficient actions to enact policies and climate solutions. In 2022, the Health and Care Act made the National Health Service in England the first health system in the world to enact net zero emissions targets into legislation. Since 2010, the National Health Service has reduced its carbon emissions by 30%, making great strides toward its goal of 80% reduction in carbon emissions by 2032.<sup>5</sup> Enacting change does not mean creating a solution overnight. Going green in dermatology is a collective effort, including advocating for climate change issues, improving sustainability in the workplace, prioritizing research to fill knowledge gaps, and supporting policies that protect the environment.

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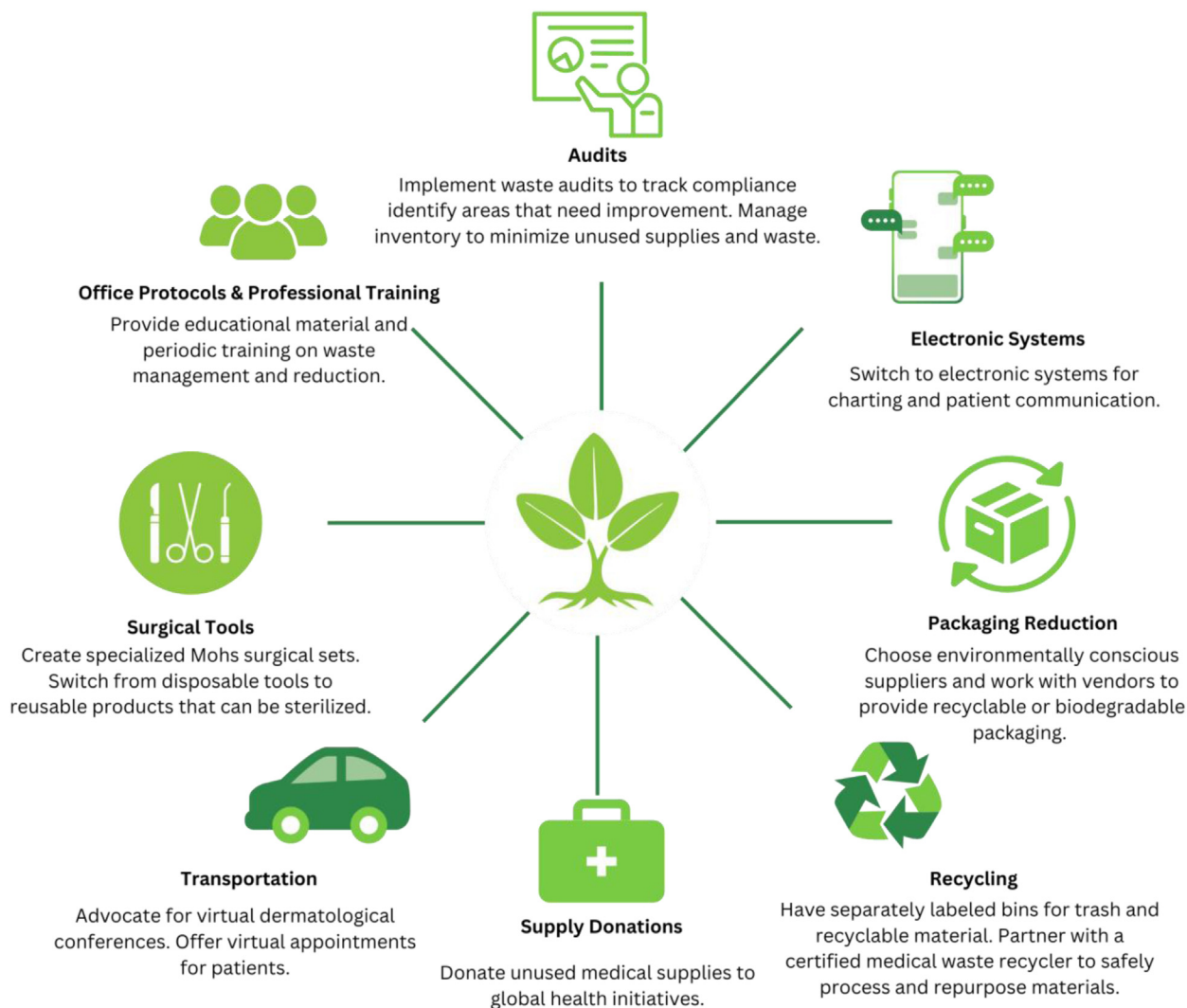
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**Fig 1.** Actionable steps toward going green in dermatology.

**Table I.** Recommendations for reducing environmental impact in the dermatological office

Issues	Interventions
Management and training Lack of office protocols and professional training on waste management and reduction.	Provide educational material and periodic training on waste management and reduction for staff. Provide guidelines and promote recycling.
Lack of waste audits.	Record waste production to track compliance and identify areas that need improvement. Carefully manage inventory to minimize unused supplies.
Office waste Excess paper waste is generated from patient sign-in sheets, appointment reminders, educational pamphlets, office brochures, etc.	Promote the use of electronic systems for patient sign-in, patient forms, visit charting, and secure patient and provider communication. Replace patient educational pamphlets or agreements with online versions.
Excess plastic and packaging are found in supplies used around the office, as well as products and medications offered for patients.	Choose more environmentally conscious suppliers and work with vendors to improve product packaging. Opt for recyclable or biodegradable packaging. Reduce the volume of samples and pharmaceutical paraphernalia.

Continued

**Table I.** Cont'd

Issues	Interventions
<p>Medical waste</p> <p>Standard surgical sets are not customized for specific procedures, which may result in unused equipment (excessive tools, gauze, etc).</p> <p>The use of disposable tools results in the accumulation of waste products.</p>	<p>Create specialized surgery sets that only contain the necessary tools required for Mohs micrographic surgery. Donate unused medical supplies to charities or global health initiatives.</p> <p>Transition to reusable products that can be sterilized where applicable. This can include surgical instruments (scalpels, biopsy punch, extractors) and patient linens (examination gowns, drapes, sheets).</p>
<p>Transportation</p> <p>Patients may have difficulty finding transportation to dermatological offices or may have to travel far distances to meet a specialist, especially in rural areas.</p> <p>Dermatology conferences require the allocation of funds for costs related to travel and accommodation. Conferences are associated with large amounts of flight-associated carbon emissions, and their high cost of attendance makes them inaccessible for some individuals.</p>	<p>Offer virtual appointments for visits that may not require an in-office visit. In-office follow-up appointments may be suggested if needed for specific care.</p> <p>Advocate for virtual conferences or for conferences to be recorded so that dermatologists may remain up to date on current standards of care or innovative technologies without having to travel to a specified destination.</p>

**Conflicts of interest**

Dr Lipner has received research funding from Moberg Pharmaceuticals and BelleTorus Corporation. Authors Islam and Tong have no conflicts of interest to declare.

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