Actionable avenues for dermatologists to reduce their environmental impact

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Abstract

Climate change poses an increasing threat to human health, with well-documented impacts on dermatologic conditions. However, the U.S. healthcare sector is paradoxically a significant contributor to climate change—worsening greenhouse gas emissions. To address this negative externality, calls to action to decarbonize healthcare delivery have spurred research and initiatives around improving the environmental sustainability of medicine. Published sustainability recommendations for dermatologic practices have addressed themes such as renewable energy, single-use disposable materials, regulated medical waste, and clinician advocacy. Our current commentary provides an analysis of the potential of existing recommendations and outlines additional, novel, and actionable interventions. We highlight recently released decarbonization resources and regulatory changes. We emphasize the importance of reassessing procedure kits, minimizing medication waste, and implementing green procurement policies. We also address nuances in promoting environmentally-conscious transit, maximizing the efficient use of technology, supporting alternatives to single-use items, leveraging resources for patient education, assessing appropriate use of carbon credits, and bolstering community climate resilience.

Keywords: climate, dermatology, management, medicine, sustainability

Introduction

Climate change has well-documented health impacts, including on dermatologic conditions [1]. However, the U.S. healthcare sector itself not only contributes 8.5% of the country's climate change-driving greenhouse gas emissions but also accounts for a significant amount of waste, pollutants, and environmental degradation, which also harm public health [2]. To address this, specialty-specific guidelines have been released calling for decarbonization and "greening" of practices. Within dermatology, publications have outlined sustainable interventions covering themes such as: renewable energy, standby power conservation, thermostat optimization, bike racks and EV charging, management of regulated medical waste, use of virtual platforms, reduction of single-use disposables, climate-health education, facility water-efficiency, and local and national advocacy [3]. In this commentary, we build upon these themes with specific recommendations of interventions to further improve sustainability within dermatology.

Discussion

Adjust procedure preparation

Reassessing the kits, set-up, and routines used in standard dermatologic procedures can yield both resource and cost savings. Biopsy trays represent a low-hanging target—a recent study found that 100% of skin biopsy trays contained more than two wasted supplies [4]. Through a straightforward, low-cost intervention setting per-biopsy limits on gauze squares, alcohol pads, adhesive bandages, and cotton swabs, clinics reduced that to 16%. Waste savings translate to cost savings. After removing unnecessary items from surgical kits, Providence

Health reported annual savings of $1.5 million in purchases and $270,000 on expired items [5].

Utilize external resources

Practices should capitalize on available resources to assist with conducting environmental impact assessments, setting sustainability objectives, and trending areas for improvement. For example, the American Academy of Dermatology offers a free partnership with the consultancy My Green Doctor to help members reduce their clinics' carbon footprints [6]. The Department of Health and Human Services, which released a net zero pledge for the health sector, and the Joint Commission, which recently released a sustainable healthcare certification, also published free online resources to support that transition [7-9].

Minimize medication waste

Billions of dollars are lost annually on medications discarded by healthcare systems and patients [10,11]. Smart medication storage and dispensing systems can inform efficient medication ordering and restocking, reducing the risk of medication expiration while at the same time tracking medication utilization rates [12]. If implementing automated medication cabinets is not feasible, employing rigorous manual medication tracking allows for better inventory control. Optimizing medication storage conditions can further minimize chances of pre-use expiration. Physicians can also play a pivotal role in pharmaceutical waste reduction by avoiding prescribing greater volumes of medication than what patients will use, leading to less discarded [13-15]. For example, patients using time-limited topical regimens like mupirocin for impetigo do not require large tubes or tubs with medication that will expire after the infection clears.

Implement green procurement policies

At least 71% of global healthcare emissions are from the supply chain [16,17]. As such, clinics should implement green procurement policies for sourcing clinic supplies and equipment and prioritizing suppliers with strong environmental credentials [18]. These include use of sustainable, circular materials leading to reduced use of packaging and shipping emissions; take-back programs for used equipment are also helpful [19]. Dermatologists could express a preference that pharmaceutical suppliers reduce packaging and shipping waste, such as by transitioning away from polystyrene foam for shipping biologic medications to patients. Patients themselves often prefer batched deliver of medications (e.g., 1-3-month supply) rather than one dose per package. This may even be expanded to pharmaceuticals themselves by updating practice guidelines to consider differential lifecycle environmental footprints of comparable medications. Comprehensive life cycle assessments importantly account for not only carbon emissions but also other indicators of health risk, such as human carcinogenic and non-carcinogenic toxicity, ionizing radiation, and particulate matter formation [20-22]. Green procurement also encompasses food, like buying local and selecting lower carbon menu items rather than meat- and dairy-heavy meals for staff lunches.

Promote environmentally conscious transit

Dermatology clinics may incentivize eco-friendly employee transportation, via designating premium parking spots for carpoolers to promote ridesharing, subsidizing commuting bicycles or bikeshares, and offering discounted public transportation passes within employee benefits. The Inflation Reduction Act has also opened new avenues for practices to promote sustainable transportation, including discounting investments in on-site EV charging stations [23]. To promote sustainable patient transit, clinic websites may include links to find public transit routes to appointments.

Maximize efficient use of technology

Shifting to teledermatology, when medically appropriate, is associated with emissions reductions [24]. Practices should develop guidelines around which routine patient visits, such as certain post-operative visits or monitoring for acne patients on isotretinoin, would be best-suited for the telemedicine setting [25-27]. Clinics should also ensure that electronic devices used in the clinic are energy-efficient and sustainably discarded. This aligns with "green IT," eco-friendly technology supply chain and efficient computing and helps to further decarbonize the largely digitized health sector [28].

Leverage resources for patient education

Practitioners can expand environmental stewardship beyond the clinic by educating patients on climate change, using available tools like EcoAmerica's free Climate for Health wearable "ClimateRx" provider badges. These badges have a QR code for patients to scan to access information about the impacts of climate on health, plus actionable steps to protect one's health in the face of environmental changes [29]. Utilizing virtual information sources in place of pamphlets can also provide up-to-date information while avoiding paper waste. The American Academy of Dermatology provides an online module, "Climate Change and Cutaneous Diseases," from which physicians may learn and then educate others about the connections between dermatologic conditions and climate change [30].

Additional avenues

Support alternatives to single-use

Single-use items are prevalent within dermatology and present a challenge to sustainability. Ongoing advancements in the development of gloves, masks, and test kits designed to degrade faster post-use may represent environmentally-friendly alternatives to traditional single-use personal protective equipment [31,32]. Clinics could integrate compostable or biodegradable options, while remaining vigilant for greenwashing (deceptive marketing that misrepresents or overrepresents the environmental benefit of a product) and practicing proper disposal, into their operations and monitor development of new options [33]. The FDA has also identified elements that make single-use devices suitable for safer reprocessing and advocacy around regulatory transparency is underway [34]. While opportunities remain for developing a unified consensus and establishing the infrastructure for evaluating reprocessors, the safe utilization of these services has the potential to significantly reduce single-use clinical waste [35]. Dermatologic organizations could further lobby to oppose unnecessarily waste-increasing guidelines proposed by healthcare regulators. A stance in favor of reusable metal, rather than single-use plastic instruments and devices is supported by recent evidence around the deleterious health impacts of microplastics, which include carcinogenicity and cardiovascular risk [36-38].

Investigate appropriate carbon credits

Carbon offsets and credits are real, yet complex, components in the equation of healthcare emissions. Although validated offsets have a role in achieving net-zero, their use must be approached with nuance. Some programs have been associated with greenwashing and environmental justice violations (unfair, exploitative treatment of certain racial, ethnic, and economic groups in environmental policymaking and practice), so it is essential to select only rigorously verified credits, such as those vetted by the Carbon Credit Quality Initiative or the Integrity Council for the Voluntary Carbon Market [39,40]. To align with best practices for claiming net zero, offsets should be employed after all other emissions have been abated to the greatest extent possible. As most practices are not yet at this stage, offsets should not be the first line of action but rather mitigators of residual, unpreventable emissions.

Bolster community climate resilience

Dermatologic complications such as skin and soft-tissue infections rank among the most common reported health issues after natural disasters [41]. Community-based dermatology clinics should be prepared to serve as climate resilience and response hubs when necessary, leveraging resources such as Harvard's C-CHANGE toolkit [42]. This toolkit equips clinics to develop comprehensive climate disaster action plans, communicate with patients about health-related climate risks, and establish response checklists for clinic staff. Environmental Justice Grants within the Inflation Reduction Act represent another opportunity for health systems to fund community climate adaptation and resilience efforts [23].

Conclusion

Herein, we present interventions for clinicians to enhance the environmental sustainability of their dermatologic practices in the near- and long-term. Environmental stewardship translates to improved patient health, both holistically and dermatologically, by mitigating release of the

greenhouse gas emissions that worsen climate change—a universal health risk multiplier—and by minimizing the release of other pollutants known to be associated with cancer and inflammatory disease. It is our hope that dermatology will embrace the recommendations contained herein, taking proactive steps toward realizing the healthcare sector's potential to help build a more sustainable future.

Potential conflicts of interest

Misha Rosenbach is Co-Chair of the American Academy of Dermatology Expert Resource Group on Climate Change & Environmental Issues, but that he speaks on behalf of himself and not the Academy. The remaining authors declare no conflicts of interest.

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