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A Step Toward Environmental Sustainability in Mohs Surgery

Promoting environmentally sustainable practices within the field of medicine is an essential yet understudied area of research. Here, we present a simple, cost-effective method to substantially decrease the environmental impact of a Mohs surgery practice. Although the health care field makes up approximately 18% of the US economy and 10% of US carbon emissions, this sector rates behind other large US industries in sustainability reporting.[1] The massive production of medical waste is a substantial factor in environmental pollution and the emission of harmful carcinogens such as mercury and dioxin.[2] The disposal of medical waste also poses a significant financial cost to institutions.[2] Unique barriers to environmentally sustainable practices and reporting do exist in the medical field. One major obstacle is the reluctance of health care providers and organizations to implement changes that have the potential to negatively affect patient outcomes, most notably rates of infection.[3] Reluctance to address environmental sustainability among health care providers may also be due to organizational constraints, fears of professional conflict, lack of available information, and evidence-based recommendations regarding appropriate use and elimination of health care resources.[3,4]

Life cycle analyses of supplies, which provide in-depth reports of the energy and resources needed to create, package, ship, and dispose of an item, are substantially lacking for products in the medical field.[4] This lack of measurable information often stagnates potential approaches to perform comparative analyses and eventually guide future purchasing/practices.[4] It has been shown that self-efficacy is a crucial factor in motivating an individual to change their behavior regarding sustainable practices.[5] Within the medical field, education efforts and open dialog about the environmental and financial impact of sustainable practices have helped leaders to implement change effectively and efficiently.[2] Specific studies exploring single procedure or practice-wide sustainability efforts have been performed in the fields of ophthalmology, general surgery, orthopedics, gynecology, critical care, and oncology, but to the best of our knowledge, there are no studies exploring beliefs and practices surrounding environmental sustainability within the field of Mohs surgery or dermatology in general.

The specific practice alteration that we suggest here involves the use of a hyfrecator or an electrodesiccation device over the use of a full electrosurgical unit capable of electrocoagulation and electrosection, which uses a disposable grounding pad and hemostatic pencil. The reason for this suggested substitution is twofold. First, the difference in per-use waste generated for each unit is substantial. The hyfrecator setup requires the use of a cautery tip and Penrose drain, generating 0.51 ounces of waste per use. The electrosurgical unit setup, on the other hand, requires the use of a grounding pad and hemostatic pencil which together generate 5.51 ounces of waste per use. This difference equates to 5 additional ounces per use and for a single surgeon averaging 500 to 1,000 cases/year, an additional 156 to 312 pounds of waste generated over the course of 1 year. Switching from an electrosurgical apparatus to a hyfrecator setup is also cost-effective for one's practice. For comparison, our electrosurgical unit has an upfront cost of approximately $9,000 for the unit with an additional per-use cost of $5.48 ($2.12 for the grounding

pad and $2.36 for the handpiece). The hyfrecator is more cost-effective with an upfront cost of $700 for the unit with an additional per-use cost of $1.45 ($0.53 for the Penrose drain and $0.92 for the hyfrecator tip). This is a difference of $4.03 per use and, for a single surgeon, an additional $2,015 to $4,030 per year. It should be noted that with many surgeons using 2 trays per case, one for layers and one for closure, these differences are doubled. This could total over 600 pounds of additional waste and over $9,000 of additional cost per year for a single surgeon.

There is a dearth of published literature about the true benefit in a Mohs field of electrocoagulation versus electrodesiccation. While the physics of each modality exceed the scope of this article, excellent text books review how electrocoagulation delivers more energy and causes deeper tissue destruction than electrodesiccation. It is therefore reasonable to surmise that there may be large, complex cases where the use of full electrocoagulation is preferred. Examples of scenarios where full electrocoagulation may be favored include large flaps on highly vascularized areas such as the nose, lips, scalp, and periocular areas. Therefore, we recommend that surgeons do not eliminate the use of full electrocoagulation from their practice but make the deliberate choice to use this more environmentally costly option when clinically indicated.

In conclusion, we recommend the use of a hyfrecator setup over more environmentally and financially costly products in any and all cases, where this substitution is safe and effective for the patient and surgical team. With this change, we highlight a simple yet effective method to substantially decrease both environmental impact and practice costs over the course of one's career. On a greater scale, we hope that this correspondence builds awareness within the field of dermatology and facilitates future discussion and research aimed at evaluating and implementing sustainable practices moving forward. People often think that the environmentally friendly choice is more expensive, but that is not always the case. An environmental and financial analysis can be easily calculated for other surgical instruments or supplies where multiple options with similar patient outcomes exist. Shining light on the compounded impact one can make with small practice changes is a crucial step in promoting self-efficacy surrounding one's motivation to combat large-scale issues such as environmental sustainability.

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Quantifying Utilization of Skin Substitutes by Mohs Micrographic Surgeons: A Cross-Sectional Analysis of Medicare Data

Dermatologists perform the most cutaneous surgical procedures across all medical subspecialties.[1] Frequently these procedures generate defects that require careful consideration as to the best option for repair. Often these wounds are adequately addressed with linear closures, local flaps, or grafts. Unfortunately, the additional incisions and undermining required of these procedures are associated with increased risk of postoperative morbidity.[2]

Many advances have been made regarding numerous biologic materials in the form of autografts, allografts, and xenografts within the past few decades. The best evidence for the use of these products lies outside the realm of Mohs surgery. The theoretical use, benefit, and safety of these materials is written about widely within the specialty, but prospective data is sparse.[3] The rate at which these materials are used among Mohs surgeons has not been described. The objective of this study is to determine the percentage of Mohs surgeons who use xenografts in their practice and to identify the anatomic sites at which they are used by these surgeons.

Methods

The 2018 Center for Medicaid and Medicare Services Public Use File contains data detailing the specific procedures billed to Medicare for that year; these data are filterable by Current Procedural Terminology code and numerous other variables. This file was accessed to determine the percentage of Mohs surgeons who use skin substitutes; further assessment was done to determine what body sites they were used by these surgeons.

For this study, a Mohs surgeon is defined as a dermatologist who billed for at least one Mohs procedure using code 17311 or 17313 (Table 1). This list was then cross-referenced with a list of dermatologists who billed for a 15271 or 15275 (Table 1) to identify the Mohs surgeons who us skin substitutes at each respective anatomic site.