



# Addressing Dermatologic Health Disparities: Characterization of a Free Dermatology Clinic for an Uninsured Population

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## Abstract

**Background:** Barriers to accessing dermatologic care are important to address for individuals without health insurance. This report aims to highlight dermatologic health disparities facing the uninsured population, to demonstrate the invaluable impact a monthly student-run free clinic can have on this population, and to encourage the implementation of dermatologic free clinics at other institutions.

**Methods:** Data was collected using the electronic medical record "Chart Reports" tool to create a query for total dermatology visits from 2012-2019. Records were reviewed and descriptive data was collected on diagnoses, medications, procedures, and follow-up rates of a student-run dermatology free clinic from 2012-2019.

**Results:** Over this period, dermatologic care was provided to 215 patients and a total of 321 diagnoses were made. The most common diagnoses included atopic dermatitis (26), seborrheic keratosis (21), and acne (17). Twenty-three skin cancer diagnoses were made, including 13 basal cell carcinomas, 8 squamous cell carcinomas, one case of melanoma, and one case of nonmelanoma skin cancer, unspecified.

**Conclusion:** A higher prevalence of atopic dermatitis, melanoma, and non-melanoma skin cancer has been reported in ethnic minorities and people of low socioeconomic status. This aligns with our results and these findings highlight the significant need for improved access to dermatologic screening and follow-up for individuals without health insurance. This report also shows the unique opportunity free clinics have to address dermatologic health disparities in the local community.

## Introduction

Many student-run clinics provide healthcare to the community's uninsured and homeless population at no cost to the patient. Uninsured individuals, such as those seen in our free clinic, are affected by dermatologic health disparities. One review reports melanoma and nonmelanoma skin cancer outcomes are poorer for ethnic minorities, people of low socioeconomic status, and less educated, elderly, and uninsured populations.<sup>1</sup> This same review highlights several studies that found a higher prevalence of atopic dermatitis (eczema) among minority populations.<sup>1</sup> Several other socioeconomic factors, such as health in-

surance status, single mother households, and urban settings were correlated with an increased risk of childhood eczema.<sup>1</sup> Additionally, there are disparities in skin cancer education and knowledge among uninsured and minority populations.<sup>2</sup> A study comparing differences in dermatologic diagnoses between homeless and non-homeless patients found more malignant and premalignant growths in the homeless population.<sup>3</sup> A significant association between homelessness and pruritus, body lice infestation, folliculitis, tinea pedis, scabies, and impetigo has also been reported.<sup>4</sup> Finally, a survey on dermatologic disease in homeless patients in San Francisco found a high prevalence of skin disorders affect-

ing the lower extremities and recommended an evaluation of the feet at every medical visit.<sup>5</sup>

Though the uninsured patient population has a significant need for dermatologic services, research shows that this need has not been adequately addressed. A survey of members of the American Academy of Dermatology found that just over half of respondents accept patients with no insurance (51.3%); furthermore, uninsured patients make up only 1.5% of the patient population seen.<sup>6</sup> Recently, teledermatology services have expanded in hopes of reaching underserved populations.<sup>7</sup> This is especially important considering patients with dermatologic conditions, such as psoriasis, require reliable access to dermatologic services as they may develop psoriatic arthritis or comorbid disease(s) requiring further follow-up care.

In summary, there is a significant need for dermatologic care in underserved populations. In this study, all dermatologic encounters at Eastern Virginia Medical School's (EVMS) student-run free clinic were reviewed from 2012-2019 to characterize the specific conditions diagnosed and managed, and to characterize the services provided for the Hampton Roads, Virginia uninsured population. The goals of this report are threefold: to highlight the dermatologic health disparities in this underserved population; to demonstrate the invaluable impact a monthly free clinic can have on this population; and to encourage the implementation of dermatologic free clinics at other institutions.

## Methods

The Health Outreach Partnership of EVMS Students (HOPES) is a student-run free clinic serving the underserved urban population of Norfolk, Virginia and the surrounding cities. To become a patient at HOPES, each patient must meet the following conditions: must be a resident of Norfolk or Portsmouth, Virginia, must make less than twice the federal poverty level according to United States poverty guidelines, and must be unable to afford insurance.

The HOPES dermatology clinic began in 2012 and is the only student-run free clinic in Virginia that offers dermatologic services for both screening and follow-up. HOPES is one of the few free

clinics that provide dermatology services in the mid-Atlantic. The clinic is held monthly, where on average, eight patients are seen. Volunteers comprise two physicians (one attending and one resident physician), two senior clinicians (medical students in their third or fourth year, or a Physician Assistant student in their final year), and two junior clinicians (medical students in their first or second year). At this time, two local physicians volunteer their time to serve the HOPES patients and rotate staffing every other month.

Data was collected using the Practice Fusion electronic medical record (EMR) "Chart Reports" tool (Version 3.7.1.177.0.4241, Practice Fusion, Inc, San Francisco, CA) to create a query for total dermatology visits from 2012-2019. Data was recorded without patient name, date of birth, or other personal identifying information. The variables recorded were as follows: patient record number, service date, age, Spanish-speaking (yes/no), English-speaking (yes/no), medications (total and type), cryotherapy performed (yes/no), biopsy performed (yes/no), excision performed (yes/no), KOH prep performed (yes/no), steroid injection performed (yes/no), recommended follow-up in documentation (yes/no), follow-up occurred if recommended (yes/no), referral outside of HOPES made (yes/no), and type of diagnoses made. The data collection tool was a password-protected spreadsheet accessible to only the principal investigator and co-investigators. Data analysis is limited to descriptive demographics. This study was approved by the Institutional Review Board at EVMS.

## Results

### *Demographics*

Since opening in 2012, approximately 2,520 total patients were seen at HOPES Clinic, which includes the primary care clinic in addition to specialty clinics such as dermatology, gynecology, otolaryngology, orthopedics, and chronic care. A total of 215 patients have been provided dermatologic care at the HOPES Dermatology Clinic, representing approximately 8.5% of the total patient population seen at HOPES. Of these patients, 20 are Spanish-speaking and 195 are English-speaking. All patients seen at the HOPES clinic are uninsured. A number of these patients

are homeless; however, the exact number of homeless patients has not been recorded in the EMR. The average age for this patient population was 50 years old. Although the dermatology clinic is open to individuals of all ages, to date, only one patient under the age of 18 has been seen.

### *Dermatologic Diagnoses*

A total of 321 diagnoses were made, indicating that a substantial number of patients had multiple diagnoses. Among the most common diagnoses include eczema, also known as atopic dermatitis (n=26, 8.1%), seborrheic keratosis (n=21, 6.5%), acne (n=17, 5.3%), psoriasis (n=15, 4.7%), basal cell carcinoma (n=13, 4.0%), nevi (n=12, 3.7%), and dermatitis, unspecified (n=10, 3.1%). Twenty-three (7.1%) skin cancer diagnoses were made including 13 (4.0%) basal cell carcinomas (BCC), 8 (2.5%) squamous cell carcinomas (SCC), one (0.3%) case of melanoma, and one (0.3%) case of nonmelanoma skin cancer (type unspecified). The majority of diagnoses were inflammatory in nature (n=116, 36.1%), with atopic dermatitis (n=26, 8.1%) and acne (n=17, 5.3%) as the leading causes. The second leading classification of diagnoses were neoplastic, representing 25.0% (n=80) of total diagnoses made. Of these, seborrheic keratosis (n=21, 6.5%) and basal cell carcinoma (n=13, 4.0%) represented the majority. Nine (2.8%) premalignant lesions (actinic keratosis) were made. The third leading classification of diagnoses were viral in nature, significant for genital warts (n=5, 1.6%) as the most prevalent. A comprehensive breakdown of all diagnoses is provided in Table 1.

### *Medications*

A total of 103 medications were prescribed, with many patients receiving multiple medications. Steroids were the most commonly prescribed medications (n=57, 55.3%) followed by antibiotics (n=17, 16.5%) and antifungals (n=14, 13.6%). A comprehensive breakdown of the medications prescribed is included in Table 2.

### *Procedures*

Twenty-seven biopsies were taken in the clinic. Cryotherapy was performed on twenty-four indi-

viduals. Fourteen steroid injections were performed. Nine excisions were performed. Five KOH preparations were completed.

### *Follow-up and Referral*

Sixty encounters explicitly recommended follow-up, and 47 of 60 returned for follow-up, a follow-up rate of 78%. Patients that required immediate follow-up care were referred out to EVMS Dermatology, Norfolk General Hospital, the Ambulatory Care Clinic, Planned Parenthood, or a private practice. Diagnoses requiring immediate follow-up include malignant neoplasms. A number of the inflammatory dermatoses such as psoriasis, atopic dermatitis, and hidradenitis suppurativa will require long-term follow-up. Patients diagnosed with autoimmune conditions including discoid lupus and sarcoidosis will require follow-up with dermatology in addition to a multidisciplinary team.

### *Clinical Vignette*

One patient presented to HOPES dermatology clinic with diffuse BCCs. The patient was a 49-year-old Caucasian male who was uninsured and homeless. He had a significant history of occupational sun exposure. On presentation, the physical exam was significant for four suspicious lesions, which were each biopsied. The most notable lesion was an irregular ulcerated plaque on the back measuring 10 cm x 9.5 cm. Pathology was positive for basal cell carcinoma in three of the four locations, the other being a benign blue nevus. The large back lesion was a deeply infiltrative BCC extending into the skeletal muscle. The patient was referred to EVMS Dermatology and Radiation Oncology for continued management and received both radiation and Vismodegib, a chemotherapy drug used in the management of extensive BCC for patients who are not surgical candidates. Additionally, the patient received electrodesiccation and cautery for the remaining BCCs. At this time, the patient remains completely free of disease and is receiving regular follow-up care with surgical oncology and dermatology. This case represents an example of the lifesaving impact a free clinic with dermatology care can have for underserved members of the community.

**Table 1.** Diagnoses grouped by etiologic class. Some subjects received multiple diagnoses.

Etiologic class	Cases, n=321 (%)	Diagnoses (n)
Inflammatory dermatoses	116 (36.1)	Atopic dermatitis (26)
		Acne (17)
		Psoriasis (15)
		Dermatitis, unspecified (10)
		Seborrheic dermatitis (6)
		Contact dermatitis (5)
		Keratosis pilaris (5)
		Lichen simplex chronicus (3)
		Rosacea (4)
		Folliculitis (4)
		Granuloma annulare (2)
		Intertrigo (2)
		Lichen planus (3)
		Neoplasms
Basal cell carcinoma (13)		
Nevus (12)		
Actinic keratosis (9)		
Squamous cell carcinoma (8)		
Lipoma (5)		
Dermatofibroma (4)		
Miscellaneous	19 (5.9)	Skin lesion, unspecified (5)
		Onychodystrophy (3)
		Cutaneous horn (2)
		Milia (2)
		Dilated pore of Winer (1)
Viral infections	19 (5.9)	Genital warts (5)
		Verruca (5)
Pigmentation	15 (4.7)	Herpes (3)
		Idiopathic guttate hypomelanosis (3)
		Lentigo (3)
Autoimmune	14 (4.4)	Hyperpigmentation (2)
		Hypopigmentation (2)
		Vitiligo (5)
		Discoid lupus (2)
Superficial fungal infections	13 (4.1)	Sarcoidosis (2)
		Hailey-Hailey disease (1)
Cystic lesions	11 (3.4)	Tinea versicolor (7)
		Onychomycosis (3)
Wounds and trauma	11 (3.4)	Sebacaceous cyst (5)
		Sebacaceous hyperplasia (3)
Hair	11 (3.4)	Epidermoid cyst (1)
		Keloid (8)
		Ankle ulcer (1)
Vascular lesions	6 (1.9)	Alopecia areata (4)
		Traction alopecia (3)
Bacterial infections	3 (0.9)	Central centrifugal cicatricial alopecia (1)
		Angiokeratoma (2)
Infestations	3 (0.9)	Hemangioma (2)
		Abscess (1)
		Boil (1)
		Scabies (2)
		Nummular dermatitis (2)
		Prurigo nodularis (2)
		Scalp inflammation (2)
		Allergic dermatitis (1)
		Anal, vaginal pruritis (1)
		Corn (1)
		Hidradenitis suppurativa (1)
		Pigmented purpuric dermatitis (1)
		Pityriasis lichenoides (1)
		Pseudofolliculitis barbae (1)
		Stasis dermatitis (1)
		Urticaria (1)
		Neurofibroma (2)
		Acanthoma (1)
		Melanoma (1)
		Nonmelanoma skin cancer (1)
		Pedunculated acrochordon (1)
		Skin tag (1)
		Suspected skin cancer (1)
		Hyperhidrosis (1)
		Nodule (1)
		Papule, unspecified (1)
		Polycystic ovary syndrome (1)
		Pedunculated nodule, unspecified (1)
		Plantar warts (3)
		Molluscum contagiosum (2)
		Condyloma (1)
		Melasma (2)
		Acanthosis nigricans (1)
		Papillomatosis (1)
		Discoloration, unspecified (1)
		Lupus pernio (1)
		Neutrophilic dermatosis (1)
		Psoriatic arthritis (1)
		Palmoplantar keratoderma (1)
		Tinea pedis (2)
		Fungal dermatitis (1)
		Fordyce spots (1)
		Scalp cyst (1)
		Healing biopsy (1)
		Scalp sore (1)
		Hirsutism (1)
		Hypertrichosis (1)
		Trichorrhexis nodosa (1)
		Senile purpura (1)
		Angiofibroma (1)
		Dissecting cellulitis (1)
		Bed bugs (1)

**Table 2.** Medications and personal care items dispensed.

Intervention	Units dispensed (n)	Specific medications/items	
Steroids	57	Triamcinolone (37) Betamethasone (6) Hydrocortisone (6) Clobetasol (4)	Prednisone (2) Fluocinonide (1) Mometasone (1)
Antibiotics	17	Doxycycline (7) Clindamycin (3) Metronidazole (3) Cephalexin (1)	Metrogel (1) Mupirocin (1) Penicillin (1)
Antifungals	14	Ketoconazole (5) Lamisil cream (2) Terbinafine (2) Clotrimazole (1)	Fluconazole (1) Nystatin cream (1) Selenium sulfide (1) T/gel shampoo (1)
Retinoids	3	Tretinoin (3)	
Personal Items	2	Hypercare antiperspirant (1)	Salicylic acid cream (1)
Aldosterone Receptor Antagonists	1	Spirolactone (1)	
Anticholinergics	1	Glycopyrrolate (1)	
Antihistamines	1	Hydroxyzine (1)	
Antimetabolites	1	Methotrexate (1)	
Antiparasitics	1	Permethrin (1)	
Barrier creams	1	Zinc cream (1)	
Cosmetic products	1	Eflornithine (1)	
Depigmenting agents	1	Hydroquinone (1)	
Disease-modifying antirheumatic drugs	1	Hydroxychloroquine (1)	
Vasodilators	1	Minoxidil 5% (1)	

### Discussion

In this study, total diagnoses, medications, and services of the dermatology clinic within the HOPES clinic were characterized since the first appointment in 2012. This study provides a comprehensive overview of the most common dermatologic diagnoses in this clinic which serves an uninsured population in an urban location. HOPES clinic diagnoses included both benign and malignant conditions of varying etiologies. Currently, there is inadequate epidemiologic data on dermatologic health disparities and the data are effectively limited to the diagnoses of skin cancer and atopic dermatitis. Atopic dermatitis was the most common diagnosis at the clinic (8%). Similar to our study, a study of a free dermatology clinic in Michigan reported that atopic dermatitis represented the most frequent diagnosis, accounting for 11% of total diagnoses.<sup>8</sup> As mentioned previously, reports suggest that atopic dermatitis may be more prevalent and severe in individuals with multiracial backgrounds, such as

those seen at HOPES clinic.<sup>1,9</sup> Further, dermatitis, namely contact dermatitis, has been found to be strongly associated with occupations that require manual labor and exposure to potential irritants, such as construction, landscaping, sandblasting, and textile industries.<sup>10</sup> Much of the HOPES patient population is comprised of individuals of lower socioeconomic status that depend on jobs requiring the aforementioned manual labor for income. It must also be noted that atopic dermatitis is exacerbated by irritants such as chemicals, in addition to factors such as emotional stress.<sup>11</sup> In order to assess for potential causes of dermatitis in this population, patients seeking treatment at free clinics should be questioned about potential exposures. Currently, there is limited data on standardized screening tools for dermatitis. However, one group created a stepwise tool used to assess for contact dermatitis in the workplace.<sup>12</sup> A similar tool may be used to improve patient screening for occupational exposures, which may cause or exacerbate dermatitis, in individuals presenting to free clinics.

Psoriasis was one of the top five diagnoses at HOPES clinic. This is notable, as psoriasis is an immune-mediated disease, which may be triggered by a number of factors including stress or injury. Further, psoriasis patients often suffer from other medical comorbidities, including increased rates of cardiovascular disease, inflammatory bowel disease, and psychiatric disorders.<sup>13,14</sup> Approximately 20% of patients with psoriasis develop psoriatic arthritis over their lifetime.<sup>15</sup> In some cases, patients with psoriatic disease require long-term, interdisciplinary care. For individuals who present to free clinics with psoriatic lesions, we advise screening for comorbidities. These patients should also be connected with primary care.

The incidence and prevalence of non-melanoma skin cancer in the United States continues to rise.<sup>4</sup> In this cohort, both SCC and BCC malignant neoplasms were among the most common diagnoses. This corroborates a previous study which noted higher rates of malignant growths in the homeless population compared to the non-homeless.<sup>3</sup> Although the rate of metastases is significantly lower in non-melanoma skin cancer (SCC and BCC), they may result in substantial morbidity and even mortality if left untreated.

Considering follow-up care may be especially difficult for this population due to unreliable housing, transportation, and work schedules, clinic staff must emphasize the importance of follow-up in the case of positive biopsy results.<sup>16</sup> Concurrent mental health disorders may also affect reliable follow-up.<sup>16</sup> Further, not all patients have reliable access to email or a mobile device. This was the case of the gentleman in the clinical vignette above. A plan for follow-up should be discussed with the patient prior to leaving clinic after a biopsy is performed. Additionally, all patients should be educated on sun-protective behaviors to help prevent future sun damage. Partnering with local dermatology offices or organizations to obtain sunscreen to distribute to patients, free of cost, may be a consideration.

At HOPES clinic, clinicians strive to be conscientious of the medications that are prescribed. Students often utilize the GoodRx platform to identify locations where patients can access the most affordable medications and direct patients to these locations prior to the end of their visit. A

recent article provides a useful table of dermatology-specific medications included in national retail prescription programs.<sup>16</sup>

Roughly 78% of patients that were recommended follow-up care returned. A study identifying factors associated with follow-up adherence in patients seen at a referral-based dermatology clinic for the homeless had a follow-up rate of 49.6%, significantly lower than the HOPES Dermatology Clinic.<sup>17</sup> The study noted increased follow-up adherence in patients with older age, male sex, more skin diagnoses, premalignant/malignant diagnoses, in-clinic procedures, shorter recommended follow-up intervals, and fewer mental health diagnoses.<sup>17</sup> More research needs to be done to identify effective strategies to improve follow-up rates in this at-risk population. Patient perceptions of their diagnoses, patient access to transportation, timely reminder notifications of scheduled visits, and patient-provider communication should be considered. Currently, HOPES Clinic has a Continuity Coordinator Team that schedules patients for their follow-up visits after patients complete their current visit. In addition, these coordinators text patients 2-3 days before their visit to confirm or reschedule if needed. Despite these measures, patients are sometimes unable to come to their appointments for various reasons.

Finally, roughly 10% of the patient population seen for dermatologic care at HOPES is Spanish-speaking. This percentage has increased since the opening of HOPES clinic in 2012, when no Spanish-speaking patients were seen for dermatologic conditions. Although our study only separated individuals by Hispanic and non-Hispanic descent, our clinic serves a large population of minority individuals. Therefore, there is a need for increased dermatologic education that is culturally appropriate. In addition, there is an increased need for written dermatologic education in Spanish so that this population is provided equal care as compared to English-speaking patients.

These findings highlight the significant need for improved access to dermatologic screening and follow-up for the homeless and individuals without health insurance. One desired outcome of this project is that student-run free clinics across the country will consider the addition of a dermatology clinic to address this need. Further-

more, we hope that institutions with a dermatology department consider the implementation of a free clinic to address the dermatologic needs of the uninsured. A study performed at Texas Tech University Health Sciences Center demonstrated the value of having a free dermatology clinic held once weekly, similar to the monthly evening dermatology clinic at HOPES.<sup>18</sup> Another study noted an 88% patient-satisfaction rate following care at a student-run dermatology free clinic.<sup>19</sup> Free clinics are an essential component in addressing the significant health disparities present in dermatologic care throughout the country.<sup>3,20</sup>

There are several limitations of this study. The clinic switched to electronic medical records in 2013, thus all paper charts used prior to 2013 were transcribed into Practice Fusion by volunteers. These charts had significantly less information available for review. Often, only diagnoses were listed without any associated information on the history of present illness, procedures completed in the clinic, medications prescribed, or follow-up recommendations. Thus, it is likely that the number of procedures completed, medications prescribed, and follow-up rate has been underreported. Secondly, medical students are completing all documentation while in the clinic. Many are still learning the art of proper medical documentation and information may sometimes be incomplete and/or inaccurate. Thirdly, this is a single-clinic study with a limited sample size, and thus, results may vary at different clinics across the country. Despite these limitations, this study adds additional information to the limited literature regarding dermatologic diagnoses and treatments at student-run clinics.

### Conclusion

This study provides an understanding of patient demographics, diagnoses, medications, services, and follow-up rates at a dermatology free clinic serving the uninsured and homeless population. This population faces a significant burden of dermatologic disease that is currently not being adequately addressed. Further research is needed in order to overcome barriers to dermatologic care faced by the uninsured and homeless population. Despite limited resources, dermatologists, residents, and students can come

together to affect meaningful change. Our clinic, with only a handful of volunteers meeting once a month, is able to provide valuable diagnoses, management, and education to our local community. Free clinics have the unique opportunity to address dermatologic health disparities and create a lasting impact on the underserved community.

### Disclosures

The authors have no conflicts of interest to disclose.

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