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Each SDPA Corporate Partner receives an annual partnership package with marketing benefits across the association's portfolio of events, plus print and web platforms.

CALENDAR OF EVENTS

ALERT: Due to the coronavirus (COVID-19) pandemic, many medical organizations have made the difficult decision to cancel or postpone planned live events. Please refer to meeting host websites for more information.

Illinois SDPA Midwest Dermatology Virtual Conference
June 11-12, 2021
https://www.isdpa.org/live-virtual/

SDPA Annual Summer Dermatology Conference
A Hybrid Conference Experience
July 22-25, 2021
Chicago Marriott Downtown Magnificent Mile
Chicago, Illinois
https://www.sdpaconferences.org/Summer2021

AAD 2021 Summer Meeting
August 5-8, 2021
Tampa, Florida
https://www.aad.org/

Georgia Dermatology Physician Assistants
Dermatology Pearls CME Conference
September 9-11, 2021
The InterContinental Buckhead
Atlanta, Georgia
https://www.gadermpa.org

Pennsylvania Dermatology Physician Assistants (PDPA)
2nd Annual Keystone Dermatology CME Conference
October 15-16, 2021
The Logan Hotel
Philadelphia, Pennsylvania
http://www.padermpa.org/keystone-derm-2021.html

SDPA Annual Fall Dermatology Conference
November 4-7, 2021
InterContinental Hotel
Los Angeles, California
https://www.dermpa.org

FROM THE PRESIDENT'S DESK:

How the SDPA & PA Community Demonstrated Resilience, Unity, & Progress During the Most Challenging Year in Recent Healthcare History

Dear Colleagues,

It's hard to believe that it's been nearly one year since I've taken office as President of the Society of Dermatology Physician Assistants (SDPA). As my term comes to a close, I can sum up the year in three words: Resilience. Unity. Progress.

RESILIENCE. Amidst our most challenging year in recent healthcare history, you never stopped showing up for your patients. I am honored to lead a Society made up of such dedicated members. You quickly learned the ropes of teledermatology and adapted your practices to follow new COVID-19 protocols.

The SDPA took notice and adjusted the way in which we navigated the year. The biggest challenge was delivering an exciting and engaging conference without the ability to meet live, in-person, face to face. SDPA quickly pivoted to create SDPA Digital 2020, which was not only our first live virtual conference, but also our highest attended conference, with over 850 attendees! Earlier this year, in response to questions surrounding Evaluation/Management (E/M) 2021 coding, the SDPA hosted two billing webinars to help prepare you to handle the changes in coding. SDPA leadership recognizes the continued interest in and desire for virtual education. In addition to the E/M 2021 webinars, we will be launching a Professional Development Series that you are sure to enjoy. And this is just the beginning of the new resources that SDPA has been working on behind the scenes. I am certain you will benefit from all the programming soon to come.

UNITY. When faced with the racial injustices in our nation, you didn't sit by idly. Many of you got involved, supporting White Coats for Black Lives (WC4BL) by participating in organized marches or simply standing together in solidarity.

The SDPA recognizes and stands firmly against racial inequality. In order for our society to thrive, we need our leadership to be as diverse as the DermPA community in our nation. We can't do that without your participation. I strongly encourage you to take a step forward and get involved within the SDPA or your local State Affiliate. You can learn more about all of our standing committees at https://www.dermpa.org/page/Committees.

PROGRESS. The American Academy of Physician Assistants (AAPA) House of Delegates recently passed a historical resolution. Our title will now be "Physician Associate." While the name change process is cumbersome and will take time to take effect, it is an exciting time for our profession. While we as PAs have no doubt in our clinical acumen, the name change may help the public recognize that we are Healthcare Providers and not "assistants" to the Provider.

It's great to have a name reflective of the work we do. But a name is just a name

if we don't have legislation to keep our profession relevant. Many states lessened PA practice restrictions in effort to increase greater access to healthcare during the pandemic. It's important for us not to take this for granted. In March 2021, I, along with a few other SDPA leaders, virtually attended the AAPA annual Leadership and Advocacy Summit. This conference highlighted the ongoing need for each of us to be involved in our AAPA State Chapters.

In order for our profession to stay current, it's important that we support legislation that modernizes our practice laws. I strongly encourage you to get involved in your AAPA state chapter, or at the very least, donate to AAPA's Political Action Committee (PAC). Donations to the PAC allow the AAPA to campaign for the needs of all PAs to our legislators on Capitol Hill. You can learn more about AAPA's PAC and advocacy efforts at: https://www.aapa.org/advocacy-central/federal-advocacy/aapa-political-action-committee-pa-pac/. It's simply inexcusable to say, "I'm too busy to care about PA legislation." If you want job security, professional growth, and the opportunity to be heard, you need to make sure you are involved in your state's legislative efforts concerning PA practice laws.

I am optimistic about the future of our profession. The SDPA membership continues to grow exponentially, now exceeding 4,300 members! Nine years ago, when I first started in leadership, we had 1,700 members. I'm proud to also report that we continue to be the largest specialty PA organization in the nation.

As I prepare to pass the gavel to my successor, I want to thank you for the opportunity to serve. It has been an honor and a privilege to lead the organization through arguably the most difficult year in our nation's recent history. I didn't do it alone, but depended on a team of talented and resilient leaders and staff. Thanks to this team effort, the SDPA thrived. Keep up the important work you continue to do daily for your patients and communities. As internationally recognized author, speaker, and business consultant Simon Sinek said, "When we help ourselves, we find moments of happiness. When we help others, we find lasting fulfillment." I look forward to seeing you in Chicago for our Summer Conference. Until then, be well.

With you and for you,

Archana M. Sangha, MMS, PA-C
President SDPA

Racial Disparity in Melanoma Survival Among Non-Hispanic Black Patients

By Kathleen R. Kane, PA-S; and Alicia Elam, PharmD

ADDRESSING PRACTICE GAPS

This manuscript addresses practice gaps in early diagnosis of melanoma, specifically acral lentiginous melanoma (ALM), in non-Hispanic Black patients and discusses the barriers which result in the disproportionately low melanoma-specific survival rate (MSS) in this population. This review of the most up-to-date studies on ALM and the worsening racial disparity of MSS provides a clinical guide to the dermoscopic and histologic diagnosis of ALM and serves as a strong call-to-action for improvement in targeted patient education to improve the melanoma survival rates in the Black population.

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This program has been reviewed and is approved for a maximum of 1 hour of AAPA Category I CME credit by the Physician Assistant Review Panel.

Approval is valid for 1 year from the issue date of June 1, 2021. Participants may submit the self-assessment exam at any time during that period.

This program was planned in accordance with AAPA's CME Standards for Enduring Material Programs and for Commercial Support of Enduring Material Programs.

SDPA members may access the post-test at https://www.dermpa.org/JDPA_Exams

Learning Objectives:

1. *Describe the racial disparity of melanoma survival rates between non-Hispanic White patients and non-Hispanic Black patients.*
2. *Differentiate between superficial spreading melanoma and acral lentiginous melanoma.*
3. *Recognize the importance of melanoma patient education and thorough skin examinations in improving melanoma-specific survival rates in non-Hispanic Black patients.*
4. *Determine areas of improvement in reducing the racial disparity of melanoma survival.*

ABSTRACT

Melanoma is widely considered as a malignancy of people with fairer skin. While the incidence of this aggressive form of skin cancer is significantly higher in non-Hispanic White populations than non-Hispanic Black populations, the melanoma survival rate among the Black population is astoundingly lower in comparison. Black patients have been found to be diagnosed with melanoma at later stages; however, survival rates are lower in the Black population at every stage of diagnosis compared to the White population. Several factors at play have been identified through the literature that could be influencing this disparity, including the differences in most common histological subtype, stages at diagnosis, socioeconomic status, health insurance, education level, and perception of risk among patients. A strong need exists for greater melanoma awareness and education among non-Hispanic Black patients as well as more frequent, thorough skin examinations by primary care physicians and dermatologists including acral regions.

KEYWORDS

Racial disparity, melanoma survival, non-Hispanic Black population, acral lentiginous melanoma

INTRODUCTION

Cutaneous melanoma is regarded as one of the most aggressive forms of skin cancer due to its metastatic potential and rank as the leading cause of skin cancer-related mortality. According to the Centers for Disease Control and Prevention (CDC) and National Cancer Institute (NCI), for every 100,000 people in the United States in the year of 2017, 23 new melanoma cases among all races and ethnicities were reported.[1] When analyzing the melanoma data provided by the US Cancer Statistics, a significant disparity is apparent between non-Hispanic White people and non-Hispanic Black people with comparison of the melanoma-specific incidence and survival rates. The incidence rate for melanoma in White people from 2013 to 2017 was 25.6 per 100,000 while the incidence in Black people was 1 per 100,000.

Even though non-Hispanic Black people are affected less commonly by melanoma than non-Hispanic White

people, the survival rates are significantly lower in the Black population compared to the White population as reported by the 2017 US cancer statistics. The five-year relative melanoma-specific survival (MSS) was 89.5 percent in White people versus 67.4 percent in Black people.[1] The great extent of this disparity has warranted further investigation regarding the potential exacerbating causes and risk factors. An analysis of the association between MSS and race using the Surveillance, Epidemiology, and End Results (SEER) database from 1975 to 2016 identified that this racial disparity in melanoma survival has worsened since 1975. This study additionally reports improvements in five-year MSS rates in most races since 2010; however, the extent of improvement in survival rates among ethnic minority groups is significantly less than that of non-Hispanic White people.[2] This discouraging trend warrants further investigation of the factors at play within the Black community that influence this disproportionately poor prognosis of melanoma. The literature has recognized a slew of these determinants and has offered recommendations regarding how to address these issues.

FACTORS AT PLAY

Histological subtype of melanoma

The four main histological subtypes of melanoma are the superficial spreading melanoma (SSM), lentigo maligna, nodular melanoma, and acral lentiginous melanoma (ALM).[3] Numerous studies analyzing the racial disparity of melanoma using the SEER database have identified that of these subtypes, Black patients make up the largest proportion of ALMs, whereas White patients represent the majority of SSMs, the least invasive subtype.[4-8] Black patients were found to be affected to

TABLE 1. Clinical Features and Diagnostic Pearls of SSM and ALM

Melanoma Subtype	Superficial Spreading Melanoma (SSM)	Acral Lentiginous Melanoma (ALM)
Risk Factors	Most common in melanoma in White patients UV radiation exposure, light skin tone, pre-existing melanocytic nevi, family or personal history of melanoma	Rare; however most common in dark skin Mechanical stress and genetic factors
Clinical findings	ABCDE - Asymmetry - Border - Color - Diameter - Evolution or elevation Presents most commonly on trunk in men and lower extremities in women	CUBED (ABCDE is not suitable for ALM) -- Colored -- Uncertain diagnosis - Bleeding - Enlarged - Delayed healing Presence of 2 or more of these requires further assessment Presents on palms, soles, and nail unit
Pearls	3- point algorithm for dermoscopic diagnosis: - Dermatoscopical asymmetry in color and structure - Atypical pigment networks - Blue-white structures Positive test = 2/3 Lesions with positive tests should be excised and histopathological analyzed[15]	3-step algorithm (for ALMs with parallel ridge pattern (PRP) 1. If lesion has PRP, biopsy regardless of size 2. If no PRP, look for benign features such as parallel-furrow, lattice-like, or regular fibrillar pattern. If benign features are present, no need for further follow up. If no benign features, proceed to step 3. 3. If no benign feature, measure maximum diameter. Lesion > 7 mm, biopsy. If less than 7 mm, periodic follow up recommended BRAAFF algorithm (for ALMs without PRP to improve dermoscopic diagnosis): any lesions with score of 1 or higher should be further evaluated - 4 positive patterns: irregular blotches (1pt), PRP (3pts), asymmetry of structures (1pt), asymmetry of colors (1pt) - 2 negative features: parallel furrow pattern, fibrillar pattern[3, 8, 15]

TABLE 2. Histological and Dermoscopic Features of SSM and ALM

Melanoma Subtype	Superficial Spreading Melanoma (SSM)	Acral Lentiginous Melanoma (ALM)
Histology	"Large atypical melanocytes with nest formation along the dermo-epidermal junction, and invasion of upper dermis in pagetoid fashion"[15]	"Diffuse proliferation of large, atypical melanocytes along the dermoepidermal junction in a lentiginous growth pattern with marked acanthosis and elongation of the rete ridges"[3]
Dermoscopy	One or more of the following: - Blue-white veil - Multiple brown dots - Psuedopods and radial streaming - Scar-like depigmentation or white milky areas - Peripheral black dots or globules - Multiple colors - Broad atypical network - Irregular vascular structures	Parallel ridge pattern (PRP) is pathognomonic - Can also see features of SSM, especially irregular diffuse pigmentation and multicomponent pattern

the least degree by the superficial spreading subtype.[4,5] Independent of race, the survival rate of patients with ALM is poorer than that of SSM, which has been deemed partially responsible for the decreased survival rates in the non-Hispanic Black population with melanoma as this population is more commonly afflicted with ALM.[4,7]

ALM is a distinct subtype that varies significantly in its presentation and disease course from the classic cutaneous melanoma *(Table 1)*.[3] Unlike SSM, risk factors for ALM do not include ultraviolet (UV) radiation exposure, personal history of melanoma, pre-existing melanocytic nevi, and fair skin type *(Table 2)*. Instead, genetic factors and long-term trauma are considered variables at play in the development of acral melanomas. With regard to clinical presentation, ALMs present on the palms, soles, and nail beds, whereas SSMs present characteristically on sun-exposed areas.[3] Several studies have identified the most common anatomical site of melanomas in non-Hispanic Black patients as being the lower extremities, which differs significantly from the trunk and upper extremities in non-Hispanic White patients.[4,5,7] The lower extremities are often overlooked in self-skin examinations and even in physician-assisted exams as this area is not considered one with significant sun exposure risk. For this reason, among several others, delays in diagnosis are not uncommon among Black patients with melanoma.[5]

Stage at Diagnosis/Tumor Thickness

Advanced stage at diagnosis and greater tumor thickness are some of the most important prognostic factors in melanoma.[6,7] For this reason, delays in diagnosis can be detrimental to the survival of an individual with this disease. Differences between histological subtypes of melanoma and racial groups have been found to be significant in determining an individual's prognosis with regard to stage and tumor thickness.

In an analysis of the SEER data from 2006 to 2015 conducted by Huang et al,[6] cutaneous malignant melanomas (CMM) were found to be diagnosed with thinner tumors compared to ALMs. This study specifically reported that 67 percent of CMMs were diagnosed at 0.01–1.00 mm of thickness and 17 percent were diagnosed at >2.00 mm. Meanwhile, 35.7 percent of ALMs were diagnosed at 0.01–1.00 mm and 44.3 percent were diagnosed at >2.00 mm. With respect to racial differences in this study, non-Hispanic Black patients displayed the highest rate of thick ALMs (>4.00 mm), whereas non-Hispanic White patients had the highest rate of thin ALMs (0.01–1.00 mm). The five-year melanoma survival rates (MSS) for ALMs at 0.01–1.00 mm and 1.01–2.00 mm were significantly lower than those same degrees of thickness of CMM.[6]

Diagnosis of localized melanoma, or early stage disease, confers a significantly higher survival rate than a later stage diagnosis with regional spread or distant metastasis.[4] Black patients have been found to present with more sentinel lymph node positive disease and distant metastases than White patients.[4,6] In fact, Black patients represent the smallest proportion of stage I diagnoses and the highest proportion of later stage diagnoses (II-IV), whereas their White patient counterparts are most commonly diagnosed with stage I disease.[5]

Interestingly, regardless of the stage at diagnosis, non-Hispanic Black patients have lower survival rates than non-Hispanic White patients. As described by Culp and Lunsford[4] in their analysis of the US Cancer

Statistics between 2011 and 2015, survival for localized stage for non-Hispanic Black populations was 85.8 percent versus 97.5 percent for non-Hispanic White people; for regional stage, survival was 52.8 percent for non-Hispanic Black people versus 63.8 percent for non-Hispanic White people and for distant stage, 19.0 percent for non-Hispanic Black people versus 19.8 percent for non-Hispanic White people. From these results and others, it is evident that Black patients experience poorer melanoma outcomes compared to White patients, even with early stage diagnoses.[2]

Socioeconomic Status

Evidence shows that socioeconomic status is a crucial determinant of melanoma incidence and outcome. An extensive review conducted by Harvey et al analyzing these associations, identified that higher socioeconomic status (SES) is associated with greater incidence of cutaneous malignant melanoma; however, it also reported that their lower SES counterparts with lower incidence rates of CMM experience greater delays in diagnosis resulting in thicker, more advanced disease and worsened mortality rates.[2,9] One of the studies analyzed in this review found that older non-White individuals with annual income less than $30,000 had the highest percentages of advanced melanoma and thicker tumors.[10] This study also found that patients living in low-income areas had lower five-year melanoma-specific survival rates compared to those residing in high-income areas. A possible explanation of this disparity was identified by the same author who determined that these patients with advanced disease living in low-income areas were less likely to receive chemotherapy compared to their counterparts living in high-income areas.[9,11]

Health Insurance

An individual's health insurance plays a crucial role in access and timeliness of health care and treatment of illness, which are major determinants of melanoma survival outcomes. An example of health insurance acting as a mediator rather than a barrier is the Health Maintenance Organization or "HMO effect." Patients with HMOs more frequently and regularly see their primary care physicians than those with fee-for-service. More frequent contact with a physician provides more opportunities for preventive skin examinations and earlier melanoma diagnoses.[9] According to a review conducted by Qian et al,[2] several studies have identified that ethinic minority groups experience longer waiting periods between diagnosis and surgery, which can help explain the disparity of survival rates regardless of stage at diagnosis. This prolonged time until treatment in ethnic minority groups is associated with health insurance status. Privately insured patients have been found to be less likely to experience delays in surgery, followed by Medicare then Medicaid.[2]

Education and Perception of Risk

A heightened perception of risk is a positive predictor of preventive behaviors in melanoma. Several studies have identified that non-Hispanic Black patients consider themselves to be at low risk of developing melanoma.[4,9,12] The general level of knowledge regarding melanoma is lower in Black people compared to White people, which translates to a lower likelihood that Black patients will perform self-skin examinations. Numerous studies have identified significantly lower rates of self-skin examinations and physician-assisted skin exams in non-Hispanic Black patients compared to non-Hispanic White Patients.[9] Black patients are also less likely to seek medical care if they have a suspicious skin lesion. This lower level of knowledge of melanoma and minimal perception of risk result in diagnoses with greater tumor thickness and lower survival rates.[9] Decreased risk perceptions have been associated with lower levels of education.[13]

Numerous studies have employed video-based interventions, focus groups, or educational class-based interventions that have aimed to increase knowledge of melanoma and promote skin-safe practices among non-Hispanic Black people and other people of color with promising outcomes.[12,14] Several interventions have incorporated photographs to encourage recognition of the ABCDEs of melanoma and increase perception of risk in darker skin types. Knowledge that melanoma is a type of skin cancer, sunburns do occur in skin of color, and people of color are at risk for melanoma increased across the board after the implementation of these interventions.

One study in particular conducted by Chao et al[12] compared the efficacy of a general educational intervention informing participants of melanoma versus a targeted intervention focusing on skin of color. The comparison group received a pamphlet about the ABCDEs of melanoma and the targeted group received a modified version of this pamphlet that included a "skin of color" section, the nomenclature "melanoma skin cancer" and "for all races and skin colors", as well as a photo of an individual performing a self-skin examination, specifically of the foot to bring awareness to the risk of acral lentiginous melanoma.[12] The "Skin of Color" section reiterated that melanoma affects all races and ethnicities and informed participants of the increased risk of a melanoma presenting in acral, subungual, and mucosal surfaces in people of color. This section was accompanied by images of ALMs on ethnic skin located on the lips,

bottoms of feet, and nail beds. Results of the study showed significant increase in skin self-examinations using the ABCDE criteria post-intervention and at the two-month follow up in the targeted intervention group. Between 40 and 57 percent of melanomas are commonly first detected by patients themselves, so this improvement in skin self-exams from targeted education is significant in improving early diagnoses. However, while perception of melanoma risk increased immediately post-intervention, the increase was no longer significant at the two-month follow up. This indicates that repeated melanoma education may be necessary to maintain a heightened perception of risk in patients with skin of color.[12]

DISCUSSION

Though we are unable to change the fact that non-Hispanic Black people are most commonly afflicted by an aggressive subtype of melanoma, ALM, essentially every other factor at play leading to delays in diagnosis and strikingly disproportionate survival rates is modifiable. Of great importance, if not greatest importance, is targeted patient education that changes the Black population's perception of their melanoma risk. Providing this population with the knowledge of their risk, how and where melanoma presents on their skin, and the importance of skin-examinations has been shown to be effective in earlier diagnoses of this disease. Because many patients have limited access to specialty care, primary care physicians should be trained to not only provide thorough skin examinations involving the feet, palms, and nails, but also to educate non-Hispanic Black patients about their melanoma risk. This patient education should be offered repeatedly as melanoma knowledge decreases over time.[12,14] Additionally, more investigation is needed in identifying barriers to postdiagnosis care and mitigating these barriers as much as possible.[15] Adequate representation of minorities in melanoma clinical trials should be a goal of improvement, as it could greatly ameliorate the limited access to immunotherapy in non-Hispanic Black patients and ultimately improve melanoma outcomes.[2]

CONCLUSION

The significant racial disparity of MSS among non-Hispanic Black patients warrants increased clinical suspicion and ongoing, targeted patient education from all medical providers, especially in the fields of primary care and dermatology. Awareness of the clinical features and common presentation of ALM in non-Hispanic Black patients will improve early diagnosis and in turn aid in the improvement of the worsening disparity overall.

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Spots on Tots: A Case Study of a Widespread Asymptomatic Rash in a Pediatric Patient

By Allyson Spillers, MPAS, PA-C, and Stevie Redmond, MPAS, PA-C

ABSTRACT

The purpose of this case study is to aid readers in recognizing the key clinical features and presentation of erythema multiforme, understanding how to differentiate erythema multiforme major from erythema multiforme minor, and establishing an appropriate treatment plan based on patient presentation.

KEYWORDS

Erythema multiforme, target lesion, mucosal lesion, pediatric rash, herpes simplex viruses, HSV, Stevens-Johnson syndrome

CASE DESCRIPTION

A two-year-old girl presented for evaluation of an asymptomatic rash on her chest, abdomen, back, face, and bilateral legs. The lesions were erythematous, macular, and annular. They were neither tender to palpation nor itchy. The eruption was approximately four weeks duration and seemed to have initially resolved following an oral course of corticosteroids, but then subsequently worsened after completion of the treatment to include erythematous macules on the buccal mucosa and outer lips (*Figure 1*). The patient's referring physician subsequently instituted oral cetirizine, oral hydroxyzine, and topical triamcinolone with mild improvement. The child was in good health with no past medical history and was not taking daily medications. She was diagnosed with erythema multiforme (EM) by a dermatologist after ruling out several other causes.

DISCUSSION

EM is an acute, immune-mediated inflammatory rash. It is characterized by target lesions that are fixed and typically distributed symmetrically on cutaneous skin.[1,2] EM is often accompanied by ulcers or bullae of the mucosa, including the mouth, genitals, or ocular regions.[2] Of mucosal regions, oral mucosa is the most common location. If only one mucous membrane is involved, it is classified as EM minor. If two or more mucous membranes are involved, it is classified as EM major.[3,4] EM minor is present without associated symptoms, while EM major may present with fever and/or arthralgias.[4] EM occurs in patients of all ages but is more frequent in adolescents and less common in the pediatric population. The epidemiology of EM is not well-known but is thought to be significantly less than one percent.[4] Currently, little is known about pediatric EM and its characteristics due to its lower prevalence.[1] Many patients may only experience one episode in their lifetime, but a small portion of patients experience recurrent bouts of EM. Recurrent EM is uncommon and not well understood, especially in the pediatric population but is believed to have a greater male predominance, lead to more hospitalizations, and less likely to be caused by HSV infection when compared to the adult population.[2] EM is a benign and self-limited condition that is believed to be overtreated pharmalogically and may lead to unnecessary hospitalizations.[4]

The most common known triggers of EM are infectious agents and drugs. Herpes simplex virus (HSV) is the leading cause of EM in both children and adults.[1] HSV-related EM is believed to involve a cell-mediated immune process targeted against viral antigens deposited in lesions on the skin.[4] This is supported by HSV DNA present in skin biopsy specimens of patients with EM. The second most common cause is by *Mycoplasma pneumoniae* infection.[1] Culprit medications known to trigger EM frequently include B-lactam antibiotics and non-steroidal anti-inflammatory drugs (NSAIDs).[3] In children specifically, the most common offending drugs are antibiotics. Although EM is rare in infants, the most common trigger during infancy is vaccination with diphtheria, tetanus, and pertussis (DTaP) vaccine being the most frequent cause followed by the hepatitis B vaccine.[1] Less common factors contributing to EM include malignancy, autoimmune disorders, radiation, sarcoidosis, and menstruation.[4]

EM was first characterized by von Hebra in 1860 as a component of a spectrum of diseases including Stevens-Johnson syndrome, toxic epidermal necrolysis (TEN), EM major, and EM minor. This spectrum was thought to represent an immune reaction from a multitude of etiologies which could be limited to skin manifestations or extend to a systemic presentation with serious morbidity and mortality. In 1993, Bastuji-Garin et al suggested EM was a separate entity from the SJS/TEN spectrum with its individual etiology, clinical course, and pathophysiology.[3]

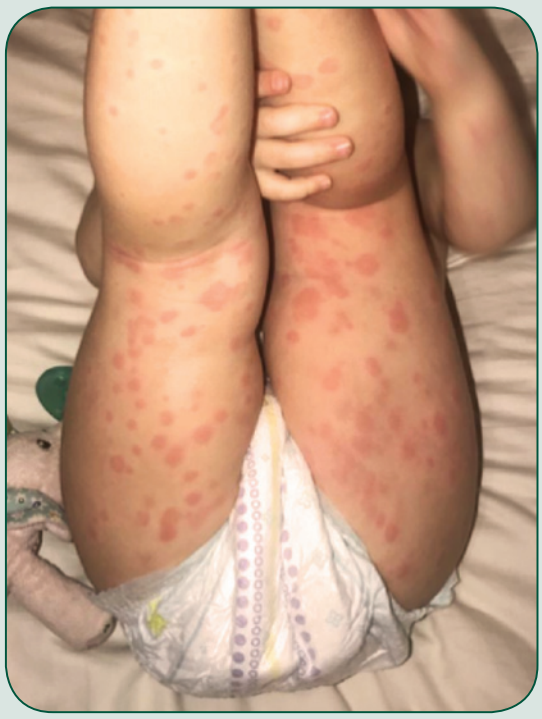

Figure 1: *Asymptomatic rash on the chest, abdomen, back, face, and bilateral legs of a two-year-old female patient initially resolved within four weeks of eruption following an oral course of corticosteroids prescribed by the referring physician. This photo was taken following completion of treatment when the rash on the bilateral legs subsequently worsened and new erythematous macules emerged on the buccal mucosa and outer lips. She was later diagnosed with erythema multiforme by dermatology after ruling out several other causes.*

The patient's history and presentation are the main diagnosing features of EM. EM lesions vary from patient to patient and may evolve over the course of the disease. However, lesions typically appear similar in a particular patient at a given time.[4] The classic presentation of EM includes acute target lesions with a well-defined annular border that are less than 3 cm in diameter. The lesions consist of three specific zones with two concentric peripheral erythematous rings and a dusky-appearing central region. Atypical lesions may appear with ill-defined borders and only two distinctive zones.[3,4] Cutaneous lesions may start as annular, erythematous papules that later evolve into the hallmark target lesions. However, target lesions are not always present. Mucosal lesions often manifest as erythema, bullae, or painful erosions.[4] Cutaneous lesions most commonly present on the upper limbs and lower limbs, followed by the trunk and face.[3, 4] The distribution of lesions is usually symmetrical and often presents on the extensor surfaces and spreads in a centripetal pattern. It may also occur at sites of trauma or sunburn. EM typically appears over the course of 3 to 5 days and resolves within two weeks, however, post-inflammatory erythema may be observed for months. Cases with significant mucosal involvement may experience prodromal symptoms including fever, malaise, arthralgias. Cough and respiratory complaints may also be present in those with EM related to *M. pneumoniae* infection.[4]

Although the diagnosis of EM is mostly clinical, a biopsy may be necessary in infants or young children to rule out autoimmune conditions.[1] A biopsy of an EM lesion will reveal subepidermal separation and necrotic keratinocytes from the central portion of the target and dermal changes, including vascular dilation and papillary dermal edema in the peripheral portion of the target.[4] There are no specific laboratory tests for EM, but laboratory markers for inflammation or infection, including white blood cell count, C-reactive protein (CRP), and erythrocyte sedimentation rate (ESR or sed rate) may be elevated in patients with EM.[3, 4] In pediatric patients, indications of infectious etiology, including fever at presentation, a history of infectious illness in the last four weeks, or laboratory markers suggestive of infection may further support a diagnosis of EM.[3]

EM is often misdiagnosed as SJS due to the similar clinical and histopathological features, however, many clinicians now recognize their differences.[2,4] Urticaria multiforme (UM), a variant of urticaria, is a common misdiagnosis of EM in the pediatric population. UM also presents with widespread annular target lesions, however, the lesions in UM are different in that they are migratory and fleeting. UM may also be accompanied by dermatographism, which is not seen in EM. Another common differential is Mycoplasma-induced rash and mucositis (MIRM), which presents as a target rash with minimal subcutaneous and mucosal involvement limited to one or two sites associated with a *M. pneumoniae* infection. It is often accompanied by a fever in pediatric and adolescent patients.[3] If the diagnosis is unclear, a skin biopsy should be performed. However, if the differential diagnosis includes autoimmune bullous disorders, a second skin biopsy with direct immunofluorescence study should be performed on unaffected skin adjacent to a lesion.[4] It is imperative to recognize EM early to avoid unnecessary use of antiviral therapy and hospitalizations.[2]

The clinical course of EM is usually self-limited and resolves within several weeks without significant sequelae, but may need to be more closely managed in the minority of patients that experience recurrent EM.[4] Management of EM in children consists mostly of supportive care but may include corticosteroids for severe cases or recurrence.[1] Although typically asymptomatic, some patients may complain of itching or burning of lesions.[4] Over-the-counter (OTC) treatment options, including diphenhydramine for itching and swelling or acetaminophen for fever or discomfort, may be implemented.[5] However, treatment of persistent or

recurrent EM in all ages of patients may prove to be difficult. Due to the self-resolving and periodic nature of EM, it is challenging to determine the effectiveness of treatment agents. First-line agents typically include corticosteroids and/or antivirals to treat underlying HSV infections. Although poorly studied, prednisone has shown clinical efficacy, but may lower the immune response, contributing to additional episodes of EM and/or recurrent HSV infections. Additionally, antiviral medications have shown efficacy in the adult population but less effectiveness in children. For patients with recurrent bouts of EM unresponsive to first-line agents, immunosuppressive or anti-inflammatory agents are often implemented. However, pediatric EM has been shown to have a lesser response to immunosuppression when compared to adult EM.[2]

CASE CONTINUED

For the patient in this case, her EM had initially been treated with a course of oral corticosteroids. After initial improvement, she began to experience a rebound worsening of the rash including mucosal involvement following completion of the treatment course. She then began a treatment regimen consisting of oral cetirizine, oral hydroxyzine, and topical triamcinolone. Several frustrating weeks went by with minimal improvement to her lesions. Due to the frequent infectious etiology of EM, an antistreptolysin O (ASO) titer was performed. Her results were significantly higher than normal range. She was then treated with a course of oral antibiotics. The rash was constant throughout treatment with no resolution of lesions, and the rash remained for 2 to 3 weeks following completion of the antibiotic and a repeat ASO titer with normal results. She and her mother were then recommended various diagnostic and treatment options, including continuation of current treatment regimen of cetirizine, hydroxyzine, and triamcinolone. Other options included a trial of an extended course of oral corticosteroids, a punch biopsy of the skin for further testing, or discontinuation of all current medications with watchful waiting. The patient's mother opted for discontinuation of all medications.

CONCLUSION

Three weeks later, the patient returned to the clinic with remarkable improvement after discontinuation of all medications and watchful waiting. The lesions were resolved with no signs of a recurrent eruption. At her six-month follow up with her pediatrician, the patient remained asymptomatic and with no evidence of lesions. Even though oral corticosteroids are often used as first-line treatment for EM lasting more than two weeks, the practice of watchful waiting proved to be effective therapy for the patient in our case in the treatment of EM.

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From The Patient's Perspective
Living with Cutaneous Lymphoma

By Sarah Gerth

I have been living in Lake Oswego, a small town outside of Portland, for more than 40 years. Originally, I am from the East Coast, growing up in Pennsylvania and Maryland, then moving to Portland in my early 20s.

I first had an outbreak of cutaneous lymphoma in 2005 and was diagnosed with mycosis fungoides (MF) Stage 1 by a local dermatologist. The diagnosis was made after a biopsy was done and sent to a specialty lab. In the past 10 years, I have had a variety of treatments. I have had radiation treatments twice on my right forearm and radiation on my right eyelid. The latter was especially difficult to endure, and radiation both times caused fatigue. The next three years, I did phototherapy treatments three times a week, but kept my time in each treatment low because my skin is very sensitive, and I burn easily. In 2017, the lesions covered over 15 percent of my body, so my oncologist started me on chemotherapy with vorinostat. This was a very difficult chemotherapy with severe side effects. I experienced fatigue, low blood cell counts, and an inability to eat much due to the strong taste in my mouth. I lost 10 pounds. Most of my hair fell out gradually over a period of four months then grew back in as curly (my hair is naturally straight).

In 2017, I found some improvement in the lesions using topical bexarotene and then topical nitrogen mustard. For the next two years, I returned to doing phototherapy treatments. My skin is so sensitive that I could only do treatments twice a week and at a low level. Therefore, it did not control the outbreaks, which again, covered over 15 percent of my skin. My lymph glands also became enlarged, putting me in Stage 2 of MF. Chemotherapy with gemcitabine was started in February of 2020. This again had severe side effects with fatigue, nausea, fevers, thinning hair, and low blood cell counts (neutropenia), so it was discontinued in May 2020.

I am happy to report I am now on an immunological chemotherapy treatment which is working well! It was necessary to have failed two previous chemotherapies to qualify for mogmulizumab as it is so expensive. I understand it has only been available for use in the past two years. I am so grateful to be getting it. I started receiving it in June and will continue infusions for the next year. There have been five treatment and I am showing some improvement in my symptoms already.

It has been a long, challenging struggle with MF these past 10 years. The treatments have been quite time consuming; applying all the lotions and gels every day, light treatment two or three times a week, and chemotherapy treatments lasting around four hours each week or so. I am so grateful for my treatments and for the care I receive from my oncology specialist and the hospital/clinic. I would recommend others who are getting treatment to find the most knowledgeable care providers and to get support from family members and friends.

I have found the Cutaneous Lymphoma Foundation (CLF) to be a great resource and encourage others to participate in it. They have answered my questions and concerns, and provided a wealth of information. The

...Continued on page 21

CUTANEOUS LYMPHOMA FOUNDATION

Cutaneous lymphomas are cancers of lymphocytes (a type of white blood cells) that primarily involve the skin. Cutaneous lymphomas are classified based on whether they are cancers of B-lymphocytes (B-cell) or T-lymphocytes (T-cell). The Cutaneous Lymphoma Foundation (CLF) is an independent, non-profit patient advocacy organization dedicated to supporting every person affected by cutaneous lymphoma. CLF's mission is to eliminate the burden of cutaneous lymphoma by promoting awareness, providing education, advancing patient care, and fostering research.

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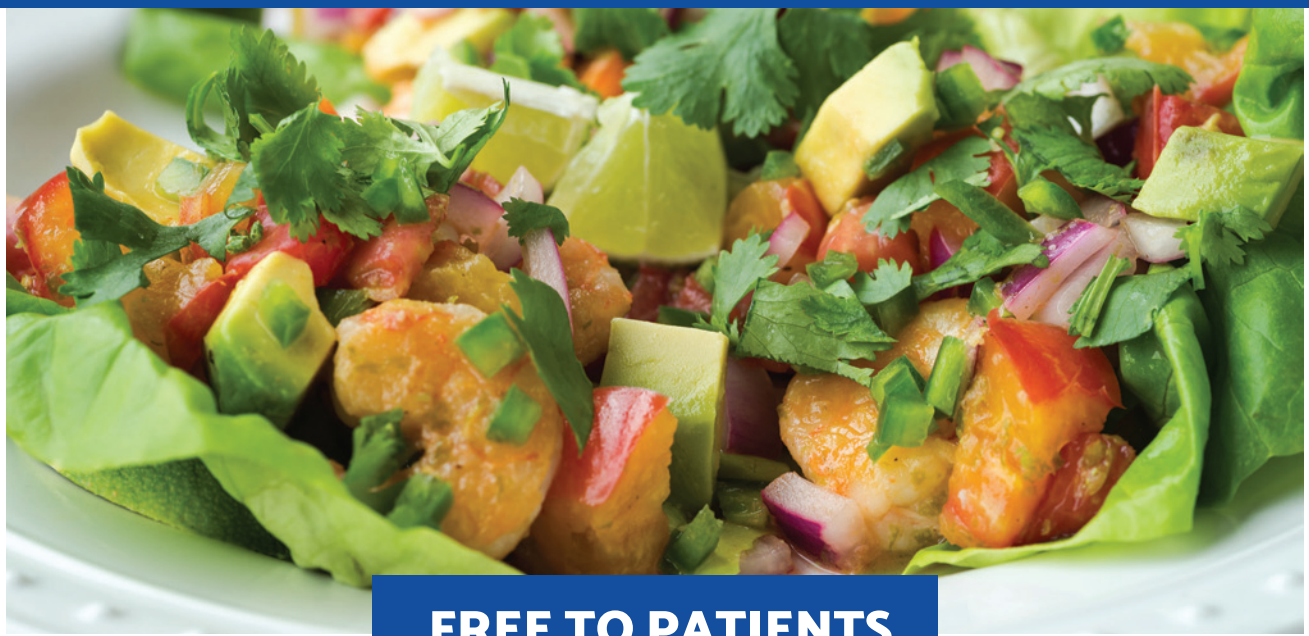

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Congenital Cartilaginous Rest of the Neck:
A Case Report and Topic Overview

By Peter A. Young, MPAS, and Emily Green, MD

CASE REPORT

A 14-year old male patient was referred to our outpatient dermatology service by his pediatric Nurse Practitioner (NP) for a firm, flesh-colored nodule on the left side of his anterior neck. *(Figure 1)* It had been present since birth and was not growing in size. He denied pain, tenderness, itch, and purulence–however, the mass rubbed daily on his shirt collar, and peers at school teased him about it, causing anxiety. The patient and his mother requested that the mass be removed. Eighteen months prior to presentation at dermatology, his pediatric NP ordered a soft tissue neck computed tomography (CT) with contrast, which revealed "a focal, nonspecific skin thickening in the left supraclavicular neck, with a prominent vein at this location. No worrisome underlying mass [was] identified." The patient's medical history included anxiety, attention deficit hyperactivity disorder (ADHD), mild depression, and enlarged vestibular aqueducts.

In joint evaluation with an attending dermatologist, we determined pilomatricoma was most likely, and the patient and parent consented to our recommendation of simple excision under local anesthesia.

During excision, a firm, white subcutaneous nodule was identified and carefully dissected with blunt-tipped curved scissors. At its base, the nodule felt "tethered" by a dense fibrous band, which was cut with some difficulty using scissors, freeing the nodule. Although the mass was confined to the dermis (superficial, far from the carotid) and in the anterior triangle (far from the spinal accessory nerve), extreme caution was exercised due to the radiologist's note of a prominent vein near the site.

After staining with hematoxylin and eosin (H&E) stain, histologic sections showed dermal cartilage and absence of a cyst. *(Figure 2)* In conjunction with the patient's history of a nodule along the lower lateral neck present since birth, these findings were compatible with the diagnosis of a branchial cartilaginous remnant (also called a cervical cartilaginous rest or congenital cartilaginous rest of the neck [CCRN].

Figure 1:
Firm flesh-colored nodule on the left anterior neck

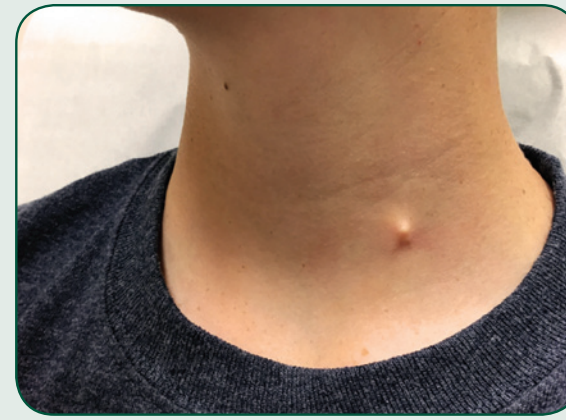
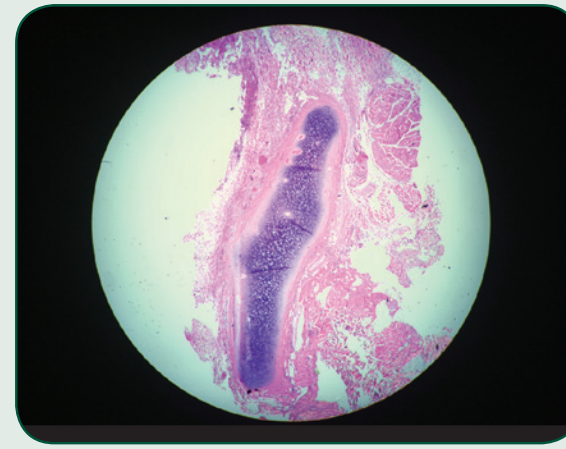


Figure 2:
Sections showed dermal cartilage and absence of a cyst



DISCUSSION

Branchial cleft remnants are the second most common congenital lesions of the head and neck in children (next to thyroglossal duct anomalies). They are anomalies of embryologic development: remnants of the branchial arch, arising from incomplete involution of branchial cleft structures during embryogenesis. Present at birth as asymptomatic skin-colored subcutaneous nodules, they are typically located over the lower anterior border of the sternocleidomastoid muscle (SCM). They may be attached to the underlying fascia by a fibrous band, which can be safely transected if excision is desired. Once excised, recurrence is uncommon.

There is a broad differential diagnosis for congenital neck masses, and branchio-oto-renal (BOR) and branchio-oculo-facial (BOF) syndromes should be suspected when a patient presents with preauricular pits and branchial anomalies. These syndromes are typically associated with hearing loss, ear malformations, and renal anomalies in the BOR syndrome.

CONCLUSION

The keys to clinically distinguishing a CCRN from other common childhood neck masses are: location (*off midline*, over the anterior SCM), history (*present at birth,* stable in size) and palpation (*"springy" feeling*, absence of a cyst or fistula).

Our patient returned for suture removal 12 days after excision, with no complications. Pathology results were discussed with the patient and mother, and he was re-examined. He did not have preauricular pits, nor other facial abnormalities. His mother stated that when his enlarged vestibular aqueducts were previously diagnosed by his otolaryngologist, he had undergone tests for renal abnormalities, which were negative.

KEY POINTS:

1. CCRNs are a rare subtype of branchial cleft remnant that can be identified clinically by presence at birth, location over the anterior SCM, and "springy" feeling on palpation.

2. Because of their superficial location in the anterior triangle (away from vulnerable anatomy, such as the spinal accessory nerve), CCRNs can easily and safely be treated with careful excision.

3. Referral to an otolaryngologist to evaluate for other congenital malformations may be necessary.

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From The Patient's Perspective
Living with Cutaneous Lymphoma

...Continued from page 18

CLF provides a newsletter and online webinars. I have had access to participating in a networking group in which I have met others who are living with this rare disease. Prior to joining the networking group, I had not met anyone else who has this disease. We have shared our stories and supported one another. I was able to attend a conference in Portland presented by the CLF a few years ago and to greatly increase my knowledge and awareness. Research into new treatments and advocacy are also provided at the Foundation. I am grateful for all of the support CLF has provided for me. Knowing I am not alone in the struggle that others are living, learning, coping, and thriving with cutaneous lymphoma is heartening.

Adjusting to the New 2021 Evaluation & Management Documentation Guidelines

Do's & Don'ts to Help You Stay in Compliance

By Jaci J. Kipreos, CPC, CPMA, CDEO, CEMC, COC, CPCI

INTRODUCTION

Welcome to Compliance Corner, a new department dedicated to providing information and tools to help keep your healthcare documentation for coding and billing compliant. This new resource aims to help you navigate recent changes to Current Procedural Terminology® (CPT®) Evaluation and Management (E/M) guidelines for office visits, which became effective January 1, 2021. Written by the American Medical Association (AMA), these guidelines contain new methodology and new definitions, both of which affect the way you as providers document the account of the patient visit.

As is often the case with significant change, attempts to comprehend and adapt to new guidelines has set off a chain reaction of follow-up questions. Here, we will provide clinical examples to assist in the explanation of these new requirements to support the different levels of service of CPT office visit codes. We will also feature YOUR questions on all compliance-related topics along with answers that walk you through the rationale for each response. Compliance Corner will contain a selection Q&As from you, the readership. If you have a scenario or question, we encourage you to send it to coding@dermpa.org for review.

Let's dig right into our inaugural installment, where we tackle the BIG questions:

1) What do these new CPT® E/M guidelines mean?

2) What are the potential confusing or gray areas? And

3) What steps do you need to take to ensure compliance?

Discussing the new guidelines is a great opportunity to review history and reflect on what was learned prior to the 2021 change. The CPT system developed by the AMA remains the most widely accepted nomenclature to report for health claims processing. The descriptive terminology and associated code numbers were intended to "speak" to providers, thus standardizing communication. Your documentation needs to properly communicate in this language all details supporting your medical decision-making process from beginning to end. This includes description of the presenting "problem," evaluation, diagnosis, treatment or "problems addressed," along with any additional services provided, such as in-office procedures.

The following cheat sheets highlighting the Do's and Don'ts of documentation will assist you in working through each step of the process.

Your Burning E/M Coding Questions... ANSWERED

Question: With these new E/M changes for 2021, I am not seeing anything about "consult" level of billing changes. My employer does want us to bill for "consults" when appropriate and to payers that still allow them, so is there anything new I should know about billing out "consults?"

Answer: These new guidelines do not apply to consult codes (99241 – 99245 or 99251 – 99252). Those codes will be audited using the 1995 or 1997 guidelines. The guidelines per CPT remain the same. The documentation for a consult must contain the three **R's** of consults.

1. Document who **R**equested the consult
2. Document the **R**eason for the consult
3. Document that the information requested was **R**eturned to the requesting party.

Question: Is the new coding like the old coding in that if we freeze actinic keratoses (AKs) then we do not also link the diagnosis of AKs to the office visit

PEARLS—THE DO's OF DOCUMENTATION

1. Problems Addressed

✔ **DO** clearly identify complexity and severity of conditions addressed.

✔ **DO** document the significance of co-existing conditions when appropriate.

✔ **DO** explain your thought process. in self-limited versus an acute uncomplicated versus an acute condition with systemic symptoms? Look at what level of complexity each is considered on the cheat sheet.

2. Data

✔ **DO** document source of all documents reviewed.

✔ **DO** identify "independent interpretation."

✔ **DO** identify an "independent historian" and explain why one was needed.

✔ **DO** document under "plan of care" all tests that are being ordered and document that it is your plan.

3. Risk

✔ **DO** document risk of medications, procedures, care plans.

✔ **DO** indicate reason for monitoring for toxicity.

✔ **DO** identify risks involved in any treatment plans and document when patient and/or family do not move forward due to risks.

✔ **DO** remember the following:

- **"RISK"** is defined as the risk of complications and/or morbidity or mortality of patient management decisions made at the visit, associated with the patient's problem(s), the diagnostic procedure(s), treatment(s).
- The **"risk of patient management criteria"** applies to the patient management decisions made by the reporting provider as part of the reported encounter.

✔ **DO** document any situation unique to the patient on the date of service.

- Example questions to think about while documenting a visit:
  - *Does every patient who presents with a new skin lesion have the same outcome?*
  - *Does every patient get the same instructions?*
  - *What is unique to the patient on the date of service for which you are providing documentation?*

PITFALLS-THE DONT's OF DOCUMENTATION

⊘ **DON'T** think that someone reading your note will give you credit for information you did not document.

⊘ **DON'T** believe that an auditor will research all drugs that you prescribe and read the interactions and give you credit for the risk of that medication if you did not document what risks are involved in taking that medication.

⊘ **DON'T** assume that just because a problem is documented in the "problem list" you will get credit for addressing that problem if your documentation does not support that it was addressed per the definitions from the guidelines.

E/M code (since it is linked to the 17000 and 17003 codes)?

Answer: If the AKs were addressed, which I am sure they were, then yes, you should link those to the visit code also. The rules of the modifier 25 indicate that you do not have to have separate diagnosis codes. However, if your business office insists, then follow that internal policy. I am stating the coding rule here and it is acceptable to use that diagnosis with the office visit CPT code.

Question: If we do a full-body skin exam and have two or more chronic stable conditions (e.g., unchanged nevi and chronic seborrheic keratoses) and we freeze two AKs on the arm and give a prescription for efudex cream for AKs on the nose, is this 99214 since we had two or more chronic stable conditions and have prescription drug management? Or can we not bill for both the medical decision making for the prescription and for the procedures 17000/17003 since they are both for the same diagnosis?

Answer: Without seeing any documentation, I am basing this response solely on the scenario provided. The two stable chronic and the prescription would equate to a 99214.

Question: If we do skin check and have two chronic stable conditions plus do a biopsy on an "undiagnosed new problem with uncertain prognosis," is this a 99214 since we made decision to do minor surgery (biopsy) with identified risks? Or, since the D48.5 is attached to 11102 code, can we not use it for our E/M code, making it a 99213?

...Continued on page 25

Type of Problem Addressed	Level of Complexity
Self-Limited/Minor	Straightforward
Acute, Uncomplicated	Low
Acute injury, complicated	Moderate
Undiagnosed new problem with uncertain prognosis A problem in the differential diagnosis that represents a condition likely to result in a high risk of morbidity without treatment. Will the documentation convey that information?	Moderate
Acute illness with systemic symptoms: An illness that causes systemic symptoms and has a high risk of morbidity without treatment. For systemic general symptoms, such as fever, body aches, or fatigue in a minor illness refer to self-limited or minor. Will the documentation convey that information?	Moderate
Chronic, stable (1) How will the documentation convey that it is a chronic conditon?	Low
Chronic, stable (2+)	Moderate
Chronic, unstable, exacerbation	Moderate
Chronic or acute illness or injury with threat to life or bodily function	High
Overall Complexity of Problem Addressed	Straightforward (99202/99212) Low (99203/99213) Moderate (99204/99214) High (99205/99215)

Complexity (2 OUT OF 3) Problems: S, L, M, H Data: S, L, M, H Risk: S, L, M, H

Data	Complexity
Category 1 • Review of prior external note(s) from each unique source*; • Review of the result(s) of each unique test*; • Ordering of each unique test* • Assessment requiring an independent historian	**Straightforward** (99202/99212) None or 1 point **Low (99203/99213)** 2 points from Category 1 **OR** - Independent historian
Category 2 Independent interpretation of a test performed by another physician/other qualified health care professional *(not separately reported);*	**Moderate (99204/99214)** 3 points from Category 1 **OR** - Category 2 satisfied **OR** - Category 3 satisfied
Category 3 Discussion of management or test interpretation with external physician/other qualified health care professional/appropriate source (not separately reported)	**High (99205/99215)** **Satisfy 2 of the three categories** **3 points required from Category 1**
Risk	**Complexity**
Plan: • Rest, observe	Straightforward (99202/99212)
Plan: • OTC, PT/OT, • Minor procedure no documented patient or procedure risk factors	Low (99203/99213)
Plan: • Prescription drug management • Deep needle incisional biopsies • Decision regarding minor surgery **with identified** patient or procedure risk factors • Decision regarding elective major surgery **without identified** patient or procedure risk factors	Moderate (99214/99214) What makes this treatment or plan a risk to this patient on this date of service?
Plan: • Drug therapy requiring intensive monitoring for toxicity • Decision regarding elective major surgery with identified patient or procedure risk factors • Decision regarding emergency major surgery • Decision regarding hospitalization	High (99205/99215)

...Continued from page 23

Answer: Consider the definition provided by the AMA:

Undiagnosed new problem with uncertain prognosis: *A problem in the differential diagnosis that represents a condition likely to result in a high risk of morbidity without treatment. An example may be a lump in the breast."*

If your documentation will support this definition (an auditor is not going to do it for you), then the problem addressed will equal moderate (99214). If your documentation does not meet this criteria, then the moderate complexity can be reached by the documentation of two stable chronic conditions.

Now, let's consider the definition of risk for minor surgery from the AMA:

Surgery–Minor or Major: *The classification of surgery into minor or major is based on the common meaning of such terms when used by trained clinicians, similar to the use of the term "risk." These terms are not defined by a surgical package classification.*

If your documentation can meet this definition, than the Risk portion would also meet the criteria for Moderate and 99214.

Meet both of those documentation requirements and yes, you have a 99214. The diagnosis D48.5 should be linked to the office visit in addition to any other conditions that were addressed.

Jaci J. Kipreos, CPC, CPMA, CDEO, CEMC, COC, CPCI, *has been working in the field of medical coding and auditing for over 30 years. She has been a Certified Professional Coder (CPC) since 1994, attained her Certified Outpatient Coder (COC) for facility-based coding in 2005, and is a Certified Professional Medical Auditor specializing in Evaluation and Management (E/M) Coding. She has expertise in coding for family practice, urgent care, obstetrics and gynecology, general surgery, and Medicare's Teaching Physician Guidelines, with a particular emphasis on E/M guideline compliance. She has served on the American Academy of Professional Coders (AAPC) National Advisory Board and is past president of AAPC's Richmond and Charlottesville, Virginia, local chapters. Kipreos is president of Practice Integrity, LLC, where she manages a national client list and provides compliance monitoring for provider documentation. She currently resides in San Diego, California.*

Disclosures: *The author has disclosed no potential conflicts of interest, financial or otherwise, relating to the content of this article.*

Address for Correspondence: *If you have a question or comment, we encourage you to send it to coding@dermpa.org.*

A YEAR LATER. Lessons learned from Practicing Dermatology in a Pandemic

By Cynthia Faires Griffith, MPAS, PA-C

Where were you when you first heard the word coronavirus? I don't know. It is interesting the things that are crystalized in your memory.

Jan 18, 2020 – The last proper trip I took was to New Orleans with a colleague. We stayed in a double room to save continuing medical education (CME) moneys, and we attended a Biologics conference put on by Tulane University. It was muggy, but we enjoyed a ride down the Mississippi on a paddleboat. *(Photo 1)*

Photo1: Author and Dermatology PA Colleague, Amanda Ziegeweid - Jan 18, 2020

Mid March 2020 – I was walking through the front office and I remember hearing that the dermatology department clinics and other ambulatory departments were noticeably decreasing their schedules and I needed to print out my schedule for the month, see all my patients on that Tuesday and the office staff would be calling all the patients from the next day onward to cancel their appointments. I work at a large academic medical institution. I knew that clinic could not function as normal for very much longer. The day before our laundry courier said he was not coming back (the dry cleaners had closed), so the clinic's linens and dry cleaning were no longer going to be laundered.

General skin examinations were canceled.* Urgent patients with cancer rashes, concerning lesions for skin cancer, drug rashes, and abscesses were going to be seen on a very limited basis Tuesday - Thursdays. Several of my colleagues who were immunosuppressed, have high risk conditions, or were over the age of 65 were unable to see patients. So, as many started the 10-week (though we didn't know how long it would be at the time) break from clinic, I started to see more urgent care type dermatology patients.

March 27, 2020 – My husband *(a critical care paramedic)* had his first COVID-19 exposure and started the 14-day monitoring period, which included twice daily temperature checks. No testing was available at this time. From this point on, there were COVID-19 exposures reported during every shift.

Early April 2020 – University initiated mask and temperature screening for employees and patients.

June 1, 2020 – We started to see general dermatology patients again. This brought in more people into the clinic. More patient interactions meant more stress and additional risk of exposure to the staff. Patients berated nursing staff that would call them to ask screening questions like, "Have you come in contact with anyone with COVID 19?"

June 26, 2020 – I was notified that I had an in-clinic COVID exposure when a patient started feeling bad after he left the office and tested positive that same evening (two days previously). The internal medicine clinic that did the test realized the patient saw me on the same day as his test and contacted the dermatology clinic. My supervising physician told me to leave clinic and wait for a call from occupational health. I was COVID-19 tested and was negative. I quarantined at home for 10 days. I took another COVID-19 test, which was negative, and then I was permitted to come back to work.

Jan 2021 – I was notified via email at 8:30pm one evening that I could register for my vaccination time slot. Early the next morning, in a very efficient vaccine roll out at my university, I got my first dose of the Pfizer-BioNTech COVID-19 vaccine. Standing in line to get my shot, I had a lot of emotions; my heart was beating fast. I was excited, overwhelmed with gratitude, and I had goosebumps thinking about how I was living through history. I also felt a sort of survivor's guilt thinking of my husband and other healthcare worker friends who were more high risk that deserved the vaccination more than me. I pushed this negative emotion aside. My thought

was the important thing is that we all get the vaccine when we have our chance to get it so that more and more people will be offered the vaccine.

Mid Jan 2021 – My husband received the Moderna COVID-19 vaccine through his employer.

Early Feb 2021 – Bill,* one of my patients with a history of lung transplant, had a skin cancer and was being sent for Mohs surgery. As his skin cancer was on his face, he was sent for a a pre-Mohs COVID-19 test, new standard protocol since early in the pandemic. Bill's wife, Lisa,* who is also my patient, sent a message via the online patient portal asking for a COVID-19 test for herself. She said she had "allergies" for two days but was feeling better. She saw her primary care physician (PCP) who offered her the test, but she wanted to have the testing done at our institution instead. So, I ordered my first *(and only)* COVID-19 test.

Photo 2: The Author vaccinating her mother with her 2nd Moderna vaccine

To my dismay, Lisa's COVID-19 test came back positive. The transplant team caring for Bill wanted Lisa to be treated with a monoclonal antibody infusion to give her the best chance of her infection not progressing, as she was in a high-risk category due to her age (> 65 years), and to hopefully protect her husband. The transplant team asked me if I could order this antibody for her. Initially, my supervising physician and I were concerned that ordering this might put Lisa ahead of others that may be more acutely in need of the treatment. We learned that our institution's procedure was that our order triggered review by a separate team that decided eligibility based on system-wide requests and availability. I had a telehealth visit with Lisa and consented her for the infusion with two nurses from my clinic witnessing the consent. I submitted the order/request and I heard back within the hour that my patient's request was approved.

That same day, we scheduled the appointment and Lisa received the infusion. Her symptoms did not progress, and her husband never tested positive for COVID-19.

LESSONS LEARNED

1. The benefit of breaks.

I did not have any days off from Jan to July 2020, and this was too long for me personally. When I took time off in July, I was burnt out. My empathy and compassion were waning. Since July 2020, I have prioritized taking a couple days off every quarter for my own sanity. I sit in the sun (with sunscreen on), run, garden. Some days, at least for a couple of hours at a time, I could forget about the pandemic. When I return to clinic, I find that I have more restored empathy and compassion levels.

2. A remedy for provider burn out can be volunteering.

Most of us are drawn to helping careers because we are helpers. Bringing milk to elderly neighbors or picking up donuts for the office gave me back the feeling that I was doing good. My husband and I volunteered two weekends at a community vaccination site. I felt like Santa Claus! Having not given an intramuscular injection in 10 years since PA school, when I went to give my first shot, I could not remove the plastic guard on the needle. It was a humbling experience, but everyone was so thankful for our time. *(Photo 2)*

3. Confidence in my clinical judgement.

I saw the need for physical distancing interventions before they were implemented, like universal masking in close contact situations. Working in an academic medical institution, I am frequently the least formally educated person in the room, but this past year and its experiences increased my confidence in my own clinical judgement.

4. Lowering expectations is a coping strategy.

As conferences, weddings, and holidays fell off the calendar, there was a sense of loss and grief, however, in return I got the opportunity to live in the moment and enjoy the simple things in life like daily walks outside, pulling weeds, and writing.

Being a Dermatology PA during a pandemic came with some feelings of helplessness, but advocating for my patient in this instance helped me remember that all of us PAs are providing needed care for our patients.

It was a window into the collective psyche to see patients every week in person from March 2020 to now. It was one of the only spaces that people were getting in-person interaction with someone who wasn't in their household. There was a feeling of shock, the feeling from patients of panic having to leave their houses for the first time to enter a public building. There were tears and anger and hostility from patients that I attributed to solitary, loneliness, and grief. Looking back, I realize I did not have the bandwidth I normally do to provide empathy and compassion for my patients. I was also scared and frustrated. I felt that it was inevitable that my husband and I were going to contract the disease from our work exposures.

CONCLUDING THOUGHTS

I really appreciated an interview series published in the Fall 2020 issue of *Journal of Dermatology for Physician Assistants* (*JDPA*) titled, "Dermatology physician assistants strong, essential to COVID-19 response coast to coast." Part 1 of the series spotlighted Jang Mi Johnson, PA-C, who went to Elmhurst Hospital in New York to work on the front lines. It was an interesting blend of clinical and family life experiences. After reading that interview, I was asked by my alma mater to write about being a healthcare worker during the pandemic. I confess that I found it difficult to start gathering my thoughts and writing on the topic. I felt that, as a Dermatology PA who stayed and worked at my "normal job," I had nothing to add to the conversation. However, as I look back now, I do think the reflection is valuable for all of us. This was a year like no other in our lives. The loss of life will forever be with us, but we have gained knowledge and resilience.

Editor's Note: In this article, the author states her experience often without full explanation in some cases as she was not always aware of reasoning for procedures/protocols at the time. Additionally, patient names have been changed for the purposes of anonymity.

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Cynthia Faires Griffith, MPAS, PA-C, is a Dermatology Physician Assistant at UT Southwestern Medical Center in Dallas, Texas, where she also earned her Masters of Physician Assistant Studies. Ms. Griffith is the co-founder of the UT Southwestern High-Risk Skin Cancer Transplant Clinic, a twice-monthly clinical initiative to serve patients who are immunosuppressed after solid organ or bone marrow transplant. She also practices general adult medical dermatology. She is Dermatology Grand Rounds Department Editor for the Journal of Dermatology for Physician Assistants (JDPA) and is a guest lecturer in the UT Southwestern PA program and a lecturer at local, regional, and national conferences. She is a member of the Texas Academy of Physician Assistants, the Society for Dermatology Physician Assistants, and the American Academy of Physician Assistants. She was awarded UT Southwestern's PA of the Year in 2017. When not practicing, Ms. Griffith is an avid sailor, marathoner, and long-distance cyclist.

Disclosures: *The author has disclosed no potential conflicts of interest, financial or otherwise, relating to the content of this article.*

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The SDPA is pleased to announce our *most recent* Diplomate Fellow Members!

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Listening To Patients
Getting the Right Drug

By Alan Rockoff, MD

You will just have to take my word for the fact that things happened exactly this way. Only the names have been changed to protect the incompetent.

"Yes, Rosebud?"

"Denny Dugan called, Doctor. He is having trouble getting the medicine you prescribed."

It was the middle of a busy day. Rosebud put me through to Denny.

"Hello, Mr. Dugan. I hear your pharmacy doesn't have Xolotl-PC? Can't they order it?"

"It's my mail-order pharmacy, Doctor, MeddleCo. They say they do have it but need to speak with you before they can dispense it."

"Why not try your local pharmacy?"

"I use the mail-order, Doctor. I'm very cost-conscious."

"Rosebud, could you please call MeddleCo? Here is the patient's name, date of birth, and ID number. You have my license, DEA, and UPIN. Please buzz me when you get to the right person."

"Hi, Doctor, it's Rosebud. I went through four people before I got to this one. I gave every one of them all the patient's numbers and your numbers. The second person told me that this is a covered medicine, no prior authorization needed, but they need to talk to you directly about it, so they kept on transferring me. Anyhow, the pharmacist is on Line 6."

"Hello, this is Dr. Rockoff. What did you need to talk to me about?"

"Good morning, Doctor. You wrote for Xolotl-PC for Mr. Dugan, manufactured by Peeples and Cootie."

"That is correct. Do you have it?"

"Did you want the Xolotl-PC solution?"

"I think that is how it comes."

"There is also a gel."

"I didn't know that."

"But the gel has been discontinued."

"I see. So you wanted to speak with me to ask whether I want the solution, or the gel that's been discontinued?"

"Yes."

"I think I'll go with the solution."

"Yes, Doctor, just wanted to check if that is the one you want."

"Is there anything else?

"Yes. You wrote that Xolotl-PC is manufactured by Peeples & Cootie."

"I just put that down in case the drug was unfamiliar and needed to be ordered."

"So you want that manufacturer?"

"If it's available as generic, then I don't care whom it's manufactured by. Does anybody else make it?"

"No."

"Then what do you want to know?"

"We're just checking to see if you want the product manufactured by Peeples & Cootie."

"But nobody else makes it."

"Yes. But we just wanted to be sure that is the one you wanted."

"So you told the patient that you have to speak to me because you need to find out whether I want the solution or the gel that has been discontinued, and if I want the drug that is manufactured by its only manufacturer?"

"Yes, Doctor. We just like to check to be sure that the medication we dispense is the one you want."

"Well, now I guess you're sure."

"Yes, Doctor."

"OK. I guess I'll go back to seeing patients now. Have a nice day."

"You too, Doctor."

"Mr. Dugan, I spoke with MeddleCo, and it's all set."

"Thanks a million, Doc. I really appreciate it! You know how important it is these days to be cost conscious."

"Oh, yes, Mr. Dugan, I know just how important it is. Take care now."

Alan Rockoff, MD, *practices dermatology in Boston, Massachusetts. He graduated with his medical degree in 1972 from the Albert Einstein College of Medicine in Bronx, New York and then completed a pediatric internship and residency at Bronx Municipal Hospital Center in Bronx, New York. Continuing his education, Dr. Rockoff completed a dermatology residency program at the combined program at Boston University and Tufts University in Boston, Massachusetts. Dr. Rockoff is a Clinical Assistant Professor of Dermatology at Tufts University School of Medicine. He has taught senior medical students and other trainees for more than 35 years.*

Dr. Rockoff has been named one of Boston's Top Doctors by Boston Magazine for five years. Dr. Rockoff is board certified by the American Board of Pediatrics and the American Board of Dermatology. Dr. Rockoff is a Fellow of the American Academy of Dermatology and a member ofthe Massachusetts Medical Society and the Massachusetts Academy of Dermatology.

Dr. Rockoff's publications have appeared in numerous journals. He writes a monthly column for his dermatologic colleagues in Dermatology News as well as a blog for the magazine Psychology Today. His first book, "Under My Skin: A Dermatologist Looks at His Profession and His Patients" is available on Amazon and is his second book, "Act Like a Doctor, Think Like a Patient: Teaching Patient-focused Medicine" is available on Amazon and at Barnes and Noble.

Dermatology Market Watch

New Report Highlights Certified PA Practice Patterns During COVID-19 Pandemic

Ninety-six percent of physician assistants (PAs) were employed in a clinical position eight to nine months after the COVID-19 outbreak.

According to the 2020 COVID-19 Survey Study Descriptive Report, a new report published by the National Commission on Certification of Physician Assistants (NCCPA), the flexibility that affords PAs to transition to other specialties and practice settings proved to be beneficial as the nation's health care providers worked tirelessly to address COVID-19. At the time of the study, approximately 7% of PAs changed specialties, with 4% changing specifically due to the pandemic. Of those, 26% changed to a hospital-based specialty in order to help with increased demand placed on facilities and providers on the front lines of COVID-19.

For patients unable to attend in-person appointments in a hospital, telemedical appointments became a vital option to accessing care. Thus, telemedicine became a significant part of PA practice in 2020, with 61% of survey respondents indicating that they utilized telemedicine during the pandemic compared to just 15% utilizing telemedicine prior. 87% of the PAs that responded indicated that they would not have been able to continue treating patients without the availability of telemedicine.

Despite this, the study found that overall patient volume was impacted by the pandemic, with 45% of PAs reporting a decrease in the number of patients treated. During the same period 54% of PAs reported no change in the number of hours worked.

"We know that prior to the pandemic, Certified PAs provided care to 9.5 million patients per week," said NCCPA President and CEO Dawn Morton-Rias, Ed.D., PA-C. "One of the reasons that we wanted to conduct this study was to gather data about the impact of this health crisis in real time."

The report also indicates that like other health care professions, 12% of PAs experienced furloughs, and 4% experienced layoffs during the initial months of the pandemic. 53% of PAs that remained employed reported that they experienced burnout.

Still, 89% of respondents reported that they feel optimistic about their ability to continue providing care for their patients. Similarly, 82% appreciate the resilience and adaptability of the PA profession, and 35% felt an increased pride in being a physician assistant.

"The role of the physician assistant was created over 50 years ago to help address health care needs during a time of unprecedented demand. During the COVID-19 pandemic, we've seen PAs practicing in their purpose as critical members of health care teams- serving on the front lines and wherever they were needed to ensure access and continuity of high-quality care," Morton-Rias said. "PAs were made for this moment."

The study captured the responses of 21,000 Certified PAs in the summer of 2020.

For more information about the National Commission on Certification of Physician Assistants, visit http://www.nccpa.net.

National Eczema Association Research Grants and Awards Open for Applications in 2021

The National Eczema Association (NEA) has been funding peer-reviewed research since 2004 as the largest private nonprofit source of eczema research support. We provide emerging and established scientific investigators with highly-sought-after grants to explore new, high-impact avenues in adult and pediatric eczema research. Ideally, all awards will generate data that can support a much larger grant proposal.

The types of competitive grants offered are noted below. See each individual grant for eligibility and application instructions. The number of grants may vary by cycle depending on available funds and quality of proposals.

UPCOMING GRANTS THAT WILL OPEN FOR APPLICATIONS IN 2021

- **Childhood Eczema Challenge Grant – up to $50,000** *(this grant cycle has been closed)*
- **Engagement Research Grant – up to $5,000**
  Small research grants for emerging investigators intended to explore a new research concept, pilot a new experiment or undertake a novel or secondary data analysis.

- **Catalyst Research Grant – up to $50,000**
  Designed to support talented early-career scientists on the path toward becoming the next generation of eczema thought leaders by supporting hypothesis-driven research projects.
- **Eczema Champion Research Grant – up to $100,000**
  Encourages proven researchers to continue research on emerging or ongoing challenges in eczema or bring their expertise to the field of eczema.
- **Impact Research Grant – up to $150,000**
  Encourages research collaboration across departments and institutions to foster multidisciplinary insights in the science and treatment of eczema.

GENERAL GRANT GUIDELINES

Proposals submitted for consideration of a NEA grant should address one or more of the following research priorities:

- **Cutting-Edge Basic & Translational Science**
- **Eczema Heterogeneity: Novel Insights**
- **Innovations in Clinical Practice & Care**
- **Understanding & Alleviating Disease Burden**
- **Eczema Prevention**

Submitted applications that are complete and meet all eligibility criteria will undergo peer review using current National Institutes of Health (NIH) grant scoring criteria (e.g. significance, approach, innovation, investigator, environment).

Direct costs will be reviewed for consistency with the proposed methods and specific aims. Budgetary adjustments may be made by the review panel or NEA. Please see individual award criteria for allowable direct costs. Indirect costs are not allowed on NEA research grants.

For more information, including all NEA grant conditions of award and answers to frequently asked questions, please visit https://nationaleczema.org/research/research-we-fund/for-researchers/.

How to Check Your Nails for Melanoma;
American Academy of Dermatology

When checking the body for signs of skin cancer, many people may only think to check their skin. However, board-certified dermatologists from the American Academy of Dermatology say it's important to check the nails, too. Although rare, skin cancer, including melanoma — the deadliest form of skin cancer — can develop under and around the fingernails and toenails. While anyone can develop melanoma on their nails, it's more common in older individuals and people with skin of color. A personal or family history of melanoma or previous nail trauma may also be risk factors.

"The good news is that when found early, melanoma — even on the nails — is highly treatable," says board-certified dermatologist Skylar Souyoul, MD, FAAD. "The best way to find skin cancer on your nails early, when it's most treatable, is to know what to look for and regularly check your nails."

When checking your nails for melanoma, Dr. Souyoul says to look for the following changes:

- **A dark streak.** This may look like a brown or black band in the nail — often on the thumb or big toe of your dominant hand or foot. However, this dark streak can show up on any nail.
- **Dark skin next to your nail.** When the skin around your nail becomes darker, it could be a sign of advanced melanoma.
- **Nail lifting from your fingers or toes.** When this happens, your nail starts to separate from the nail bed. The white free edge at the top of your nail will start to look longer as the nail lifts.
- **Nail splitting,** which occurs when a nail splits down the middle.
- **A bump or nodule under your nails.** You might also see a band of color on your nail. It could be wide and irregular or dark and narrow.

"Nail melanoma is often diagnosed at a more advanced stage than melanoma on the skin, making it more dangerous for your health," says Dr. Souyoul. "If you notice any changes to your nails, including a new dark band on your nail, make an appointment to see a board-certified dermatologist."

These tips are demonstrated in "How to Check Your Nails for Melanoma," a video posted to the AAD website and YouTube channel. This video is part of the AAD's "Video of the Month" series, which offers tips people can use to properly care for their skin, hair, and nails.

Skin cancer is the most common cancer in the U.S., and nearly 20 Americans die from melanoma every day. In recognition of Skin Cancer Awareness Month, the AAD is encouraging Americans to *#PracticeSafeSun* to protect themselves and their families from skin cancer. The public can help raise awareness of skin cancer by using the hashtag *#PracticeSafeSun* when sharing AAD resources on skin cancer prevention and detection. Additionally, individuals who have been affected by skin cancer can share their personal stories on SpotSkinCancer.org to provide support and inspiration for others fighting skin cancer.

For more news from the AAD, visit http://www.aad.org/news

Galderma Launches New Multichannel Medical Education Platform:
Inaugural Webinar Series on the Impact of Mask Wearing on Skin Diseases

Galderma announced the launch of its Galderma Excellence in Multichannel Medical Education (GEMME) platform with a four-part webinar series: Unmasking Facial Skin & Dermatoses. Free for healthcare professionals from around the world, this event offers a unique opportunity to gain expert insights and exchange knowledge.

The series will run every three weeks from May 8 to July 10, 2021. Through presentations from renowned dermatology experts, it will highlight the impact of essential COVID-19 mask wearing on skin health, including for acne and rosacea sufferers.

"Galderma is committed to providing premium expert-led education that is focused on the needs of the dermatology community. I am delighted to announce the launch of Galderma's new GEMME platform, featuring unique insights from dermatology experts worldwide. We are beginning with a particularly timely topic, the specific challenges COVID-19 has caused for healthcare providers and patients living with dermatological diseases," said Dr. Baldo Sforzolini, Galderma's Global Head of Research and Development.

Each webinar will offer an interactive experience through live Q&A sessions with world-renowned dermatology experts. Registration for the webinar series is free and can be accessed by all healthcare professionals at: https://www.gemme-unmasking-webinars.events

Unmasking Facial Skin & Dermatoses Webinars:

- **Webinar 1** on Saturday May 8: Under the mask: the consequences of essential mask wearing
- **Webinar 2** on Saturday May 29: Mask wearing and Rosacea: protection or trigger?
- **Webinar 3** on Saturday June 19: Zooming on 'mAsKNE': more than a trend
- **Webinar 4** on Saturday July 10: Under the mask: protecting the barrier that matters

"This webinar series will support healthcare providers in tackling issues arising from essential mask wearing on skin health in clinical practice. It will help to address patient needs and raise interest in the development of new guidelines and research. There is a lot of knowledge to be gained from the current pandemic, including how to mitigate the consequences of mask wearing on facial skin diseases. We are excited to share our knowledge and learnings with the healthcare community to support ongoing improvement in patient outcomes," said Prof. Dr. Jerry Tan, Webinar Series Chair and Adjunct Professor, Western University, Ontario, Canada.

For more information, visit https://www.gemme-unmasking-webinars.events/.

CorEvitas(SM) Achieves Enrollment Milestone of 15,000 Patients with Immune-Mediated Skin Conditions in its Psoriasis and Atopic Dermatitis Registries

CorEvitas℠, the leading sponsor of registries in autoimmune and immune-mediated diseases, announced it has enrolled over 15,000 patients with immune-mediated skin diseases in the CorEvitas registries for moderate to severe psoriasis and atopic dermatitis (AD).

This notable milestone was achieved by building on the company's real-world evidence program and dermatology site network of more than 500 committed investigators, initially developed for the CorEvitas Psoriasis Registry, a collaboration with the National Psoriasis Foundation (NPF). Established in 2015, the Psoriasis Registry has enrolled over 14,000 patients at more than 200 sites across the U.S. and Canada and is being used to support post-approval safety commitments to the FDA for multiple recently approved biologic therapies. In addition, the registry has generated 19 manuscripts and 91 abstracts on studies evaluating the effectiveness of psoriasis treatments, their impact on quality of life, and characterizations of patient sub-populations.

Similar studies are expected from the CorEvitas AD Registry, with over 1,000 patients enrolled since the registry launch 9 months ago. Dr. Jonathan Silverberg, Associate Professor of Dermatology, George Washington University School of Medicine and Health Sciences in Washington, DC, and Dr. Eric Simpson, Professor of Dermatology and Director of Clinical Research at Oregon Health & Science University in Portland serve as Scientific Co-Directors of the registry. The registry has been designed to fill a major gap in real-world evidence generation for patients with AD on drug effectiveness and safety, collecting a comprehensive dataset on disease phenotypes, comorbidities, treatment effectiveness, quality of life, and long-term drug safety.

"There is immense value in the independent CorEvitas dermatology registries in their robust and longitudinal collection of validated clinical outcomes and patient reported outcomes, which enables us to evaluate and contextualize the real-world safety and effectiveness of approved therapies," said Dr. Silverberg.

"We are truly grateful to the NPF and the dermatology investigator network that we have built, uniquely positioning CorEvitas to study a range of immune-mediated skin conditions to benefit our patients," said Dr. Jeff Greenberg, Chief Medical Officer of CorEvitas.

To learn more about the CorEvitas Atopic Dermatitis and Psoriasis Registries, visit https://www.corevitas.com/registry/atopic-dermatitis

https://www.corevitas.com/registry/psoriasis

Nitric Oxide Generating Formulation as an Innovative Approach to Topical Skin Care: *An Open-Label Pilot Study*

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ABSTRACT:

Nitric oxide (NO) plays multiple roles in both normal and abnormal skin processes. Its deranging disbalance is involved in the pathogenesis of multiple dermatologic diseases such as acne vulgaris, pointing towards beneficial therapeutic directions. A novel NO-producing gel-formulation was tested beneficial in the treatment of acne vulgaris in an open-label pilot study using clinical evaluation scores. It showed a decrease of comedones and inflammatory pustulae and reduced the Global Acne Grading System score by 50% within eight weeks. In addition, we demonstrate a potential use as cosmetic agent where NO therapy leads to an increase of skin integrity and a reduction of skin ageing processes.

KEYWORDS:

Nitric oxide; NO; acne vulgaris; topical therapy; skin ageing

1. INTRODUCTION

Nitric oxide (NO) is a diatomic molecule that plays many roles in both normal and abnormal skin processes.[1,2] There is strong evidence that NO-releasing materials may serve as new, unique therapeutic agents.[3] The skin's cell population consists of keratinocytes, endothelial cells, fibroblasts and other residing or circulating immune cell types. Nearly all of them express isoforms of nitric oxide synthase (NOS) enabling NO production which is essential for physiologic processes like antimicrobial defense, regulation of circulation as well as erythematic response to ultraviolet light exposure.[3–5]

While endothelial NOS (eNOS) produces lower levels of NO, the inducible NOS (iNOS) produces larger amounts of NO when stimulated by e.g., bacterial products or cytokines.[6] NO is furthermore involved in creating the protective skin layer.[3] Therefore, NO is essential to maintain skin balance.

1.1. ACNE VULGARIS

Facial acne vulgaris is the most common skin disease in adolescents and adults and a primary inflammatory disorder of the pilosebaceous unit of multifactorial etiology.[7] Four interrelated mechanisms are implicated in the development of acne vulgaris and responsible for underlying skin disbalance: increased sebum production, alterations of the follicular keratinization processes, inflammation and colonialization of Cutibacterium acnes (formerly Proprionibacterium acnes).[8] With its long-lasting psychological negative effect, acne vulgaris has a negative impact on the patient's quality of life.[9] Treatment of acne reaches from mild topical cleaners to systemic treatment with antibiotic agents or antihormonal therapies, resulting in a therapeutic burden for many patients.[7]

Within a physiological range, NO possesses a concentration-dependent antimicrobial and immuno_ modulatory bimodal activity.[6] However, using higher concentrations in topical application, NO demonstrates anti-inflammatory and antimicrobial properties, the latter without the risk of generating microbial resistance.[3,10]

1.2. NO AS A COSMETIC AGENT

Skin aging is, besides the biological age, dependent on the exposure to environmental factors, which affect the skin by structural and functional changes resulting in known characteristics like loss of elastic capacities, formation of wrinkles and loss of skin moisture.[6] Most of them being a target of cosmetic treatments. Due to its capability of restoring the skin barrier, NO application increases skin moisture[3] and possesses the capability of enhancing human collagen synthesis.[4] Due to its molecular size and distinct lipophilicity, NO itself can easily penetrate the outer layers of the skin but its potency is limited by its short half-life.[3,6] Therefore, different

delivery platforms capable of stable release over a defined time period have been developed. Acidified nitrate cremes use acidic disproportionation for the release of NO, diazeniumdiolates act as direct NO-donators while direct application of gaseous NO or NO-releasing nanoparticles represent another way of application.[6,11] Nevertheless, the different application systems have limitations including the risk of methemoglobin formation on diazeniumdiolates, expensive and difficult release mechanisms in the case of gaseous formulation or technical issues concerning production and acceptance of nanoparticles. We therefore designed a novel NO-generating mutual-activating dual gel formulation and more fluid serum formulation with enhanced penetrative and nutritive properties which was examined for preliminary efficacy and proof of concept in mild to moderate acne (gel formulation) and as a cosmetic agent (serum formulation).

2. MATERIALS AND METHODS

A novel NO-producing dual component mutual-activating gel formulation with 1% low molecular hyaluronic acid was examined for preliminary clinical efficacy on acne vulgaris in a single-center retrospective study with an open-label proof-of-concept design. The formulation was produced in pharmaceutical purity (>95%). The study was conducted in the Department of Dermatology, University Hospital Essen. Retrospective analysis of acne vulgaris patients was approved by the local ethics committee (20-9698-BO). For clinical evaluation as a cosmetic product agent, another single-center open study was conducted to assess the acceptability and efficacy of the investigational product after four weeks of use of the serum-formulation. Due to cosmetic product testing, ethics committee approval was not required. All subjects gave written informed consent for participation and publication. Histological analyses of 4 mm-diameter intact upper arm skin were performed using hematoxylin and eosin (H&E) staining. In-vitro (1 cm^3 of each component) and on-skin (7 cm^2 skin surface) NO-production capabilities were proofed using a nitric oxide chemiluminescent detector (CLD).[1,2]

2.1. PATIENT POPULATION

Patients referring to our out-patients clinic for the treatment of acne vulgaris were evaluated for the study. Ten consecutive patients of both genders were included in the study. Inclusion criteria were: age between 18–50 years and clinical diagnosis of mild to moderate acne, mainly located on the face. Each patient was instructed to apply a thin film of the two components topical gel as a monotherapy twice a day for 12 weeks. The two components were applied one after another and then mixed on the skin. Before topically applying the medication, patients were invited to thoroughly wash their facial skin using a gentle, nonmedicated cleanser, rinse with warm water and gently pat dry. Clinical and instrumental evaluations were performed at the beginning of the treatment (T0), after four weeks (T1) and after eight weeks (T2).

2.2. PROBAND POPULATION

The two components topical serum-formulation was tested in healthy volunteers. 11 women and four men (mean age 42 years) participated for clinical evaluation as a cosmetic agent. After four weeks of twice daily facial application, participants completed a questionnaire on the serum characteristics and effects. Skin samples were collected from the identically treated upper arm section.

2.3. EFFICACY AND SAFETY EVALUATION

The main outcome of this study on acne was a change in the acne lesion number. Evaluation included the Global Acne Grading System (GAGS) to assess acne severity.[12] GAGS is a quantitative scoring system in which the final score is calculated by the sum of six regional subscores, which in turn derives by multiplying an established factor for each facial region.[13] Only patients suffering from mild to moderate facial were enrolled. Lesions count, through which major acne lesions are independently assessed, were comedons, papules/pustules and nodules/cysts.[14] The face was divided into several regions such as nose, forehead, each cheek, and perioral region. Photographic assessment was performed at each visit. The Dermatology Life Quality Index (DLQI) [15] was assessed at TO (beginning of treatment), T1 (4 weeks) and T2 (8 weeks). A questionnaire filled by the patients to assess the tolerability of the product (excellent, good, fair, poor) and the presence of side effects. For cosmetic evaluations, wrinkles, structural integrity and smoothing of the skin relief were evaluated using a full face imaging system (Observ 520, InnoFaith Beauty Sciences, Eindhoven, The Netherlands). Images and H&E staining were evaluated visually by experienced dermatologists.

3. RESULTS

3.1. MEASUREMENT OF NO-GENERATION

Using the closed CLD system, an in vitro mixture of 1 cm^3 of each component resulted in stable generation of NO, initially exceeding 23.847 ppb, resulting in a plateau phase of >15 min *(Figure 1)*. NO generation was, although decreasing, still detectable 30 min after initial application. On-skin measurements on 7 cm^2 intact skin showed comparable generation of NO.

3.2. CLINICAL EVALUATION OF THE GEL FORMULATION IN ACNE VULGARIS

A total of 10 consecutive patients (one male and nine female) were enrolled in the study. Patients were assessed from June 2020 to October 2020. The mean age was 34.4

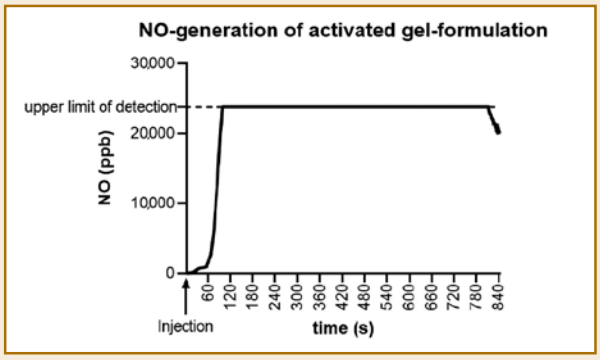


Figure 1. *Nitric oxide (NO)-generation of activated gel-formulation. In vitro mixture of 1 cm³ of each component resulted in stable generation of NO, exceeding the upper limit of detection of 23.847 ppb NO, resulting in a plateau phase of >15 minutes after activation time of approximately 60 s.*

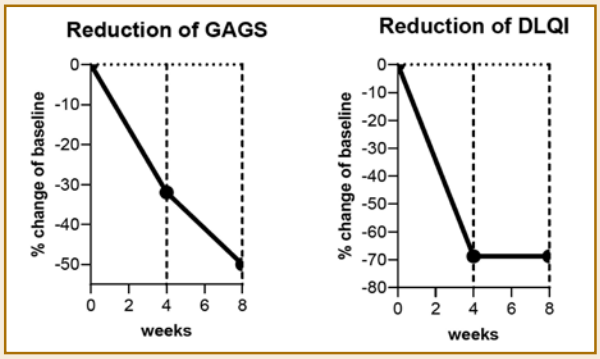


Figure 2. *Clinical improvement of acne vulgaris. (a) The Global Acne Grading System (GAGS) score was reduced by 32% after eight weeks of nitric oxide (NO)-producing gel treatment. (b) The Dermatology Life Quality Index (DLQI) more than halved resulting in an approximately 70% reduction, indicating only a minor remaining decreased quality of life after treatment with NO-producing gel formulation.*

years. All patients completed the study and there were no drop-outs. The GAGS score showed a 32% reduction from T0 to T1 and 50% from T0 to T2 (mean values 14.8 at T0; 10.1 at T1; 7.4 at T2) *(Figure 2a)*. The DLQI more than halved within four weeks from 3.2 points to 1 point, indicating only a minor remaining reduction in life quality *(Figure 2b)*. After four weeks of treatment (T1) the tolerability of the treatment was considered excellent according to 40% of subjects; good according to 50% of subjects, and fair according to 10% of subjects. No severe side effects were reported. Eight weeks of treatment reduced the amount of open and closed comedones (mean reduction of 12.5 comedones (80% reduction)) as well as inflammatory pustulae (mean reduction of 2.5 pustulae (65% reduction)) resulting in an overall purer skin texture. Patient examples of improved acne disease are displayed in *Figure 3 a,b.*

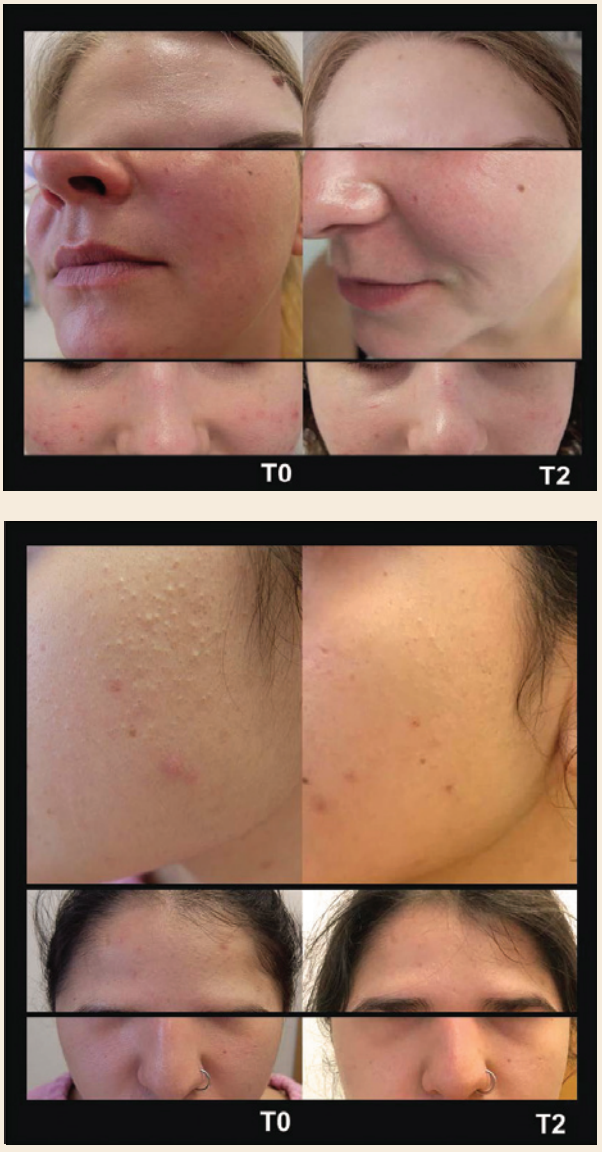
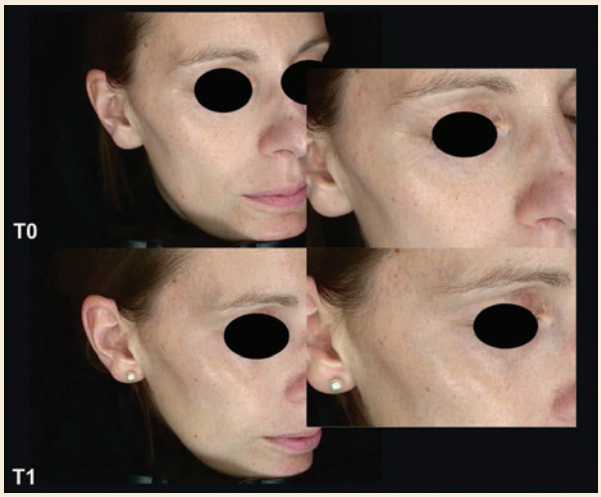


Figure 3. *Improvement of acne vulgaris. Eight weeks of nitric oxide (NO)-producing gel formulation treatment (T2) reduced the amount of closed and open comedones and inflammatory pustulae in mild (a) and moderate (b) acne resulting in a purer skin texture.*

3.3. CLINICAL EVALUATION OF A NO-PRODUCING SERUM AS COSMETIC AGENT

The results of the efficacy questionnaire are shown in *Table 1.* Of note, 73% of the participants stated that the product provided immediate hydration, 80% of participants found that the skin appeared brighter, and 73% of participants found that wrinkles, if present, had decreased or softened. The cosmetic qualities were evaluated favorably, and 86% of participants liked the product overall. Application of the product visually reduced wrinkles and dry lines *(Figure 4a)*. Furthermore, application over four weeks resulted in an improvement of structural integrity with an increase of elastic fibers and an increase of papillary dermis *(Figure 4b)* and



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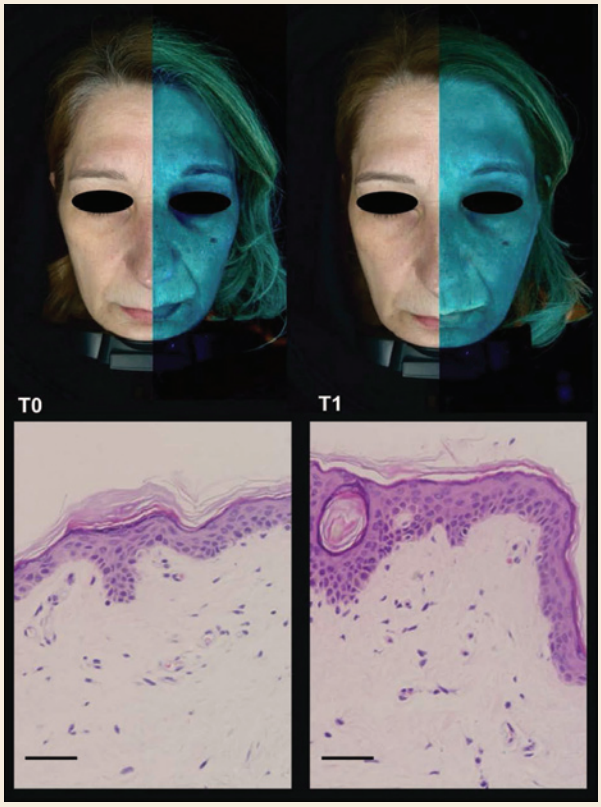
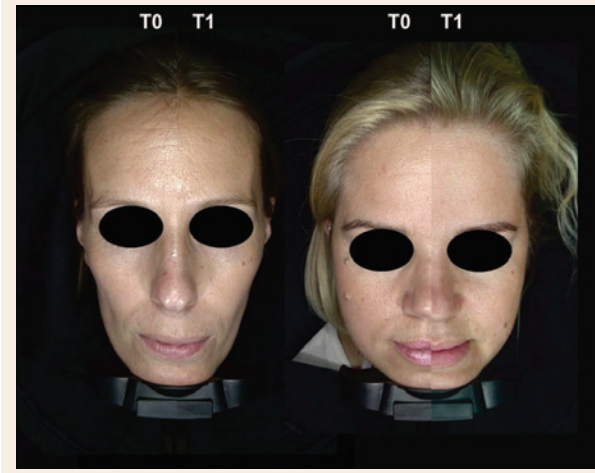


4 (b)

Table 1. Results of the efficacy questionnaire.	
Question of Efficacy Questionnaire	Percentage
"I felt an improvement in skin hydration"	73%
"My lines and wrinkles have softened (are less notable)"	73%
"The skin of my face looks brighter"	80%
"The texture of my skin is improved"	86%
"I liked the product overall"	86%
"I would like to continue using the product"	86%



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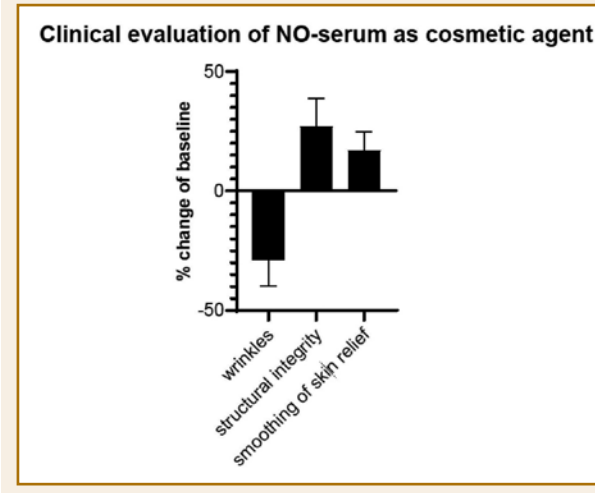

4 (d)

smoothing of skin relief *(Figure 4c)*. Overall changes are indicated in *Figure 4d*. No abnormal clinical signs were observed in any patient after four weeks of serum use.

4. DISCUSSION *(See Table 1)*

Acne vulgaris of the face is one of the most encountered diseases in all dermatology and primary care practice and inherits a distinct disease burden with a high degree of psychosocial anguish, even in its mild form.[7,16] Although improvements in medical and nonmedical treatment have improved patients' outcomes in severe acne vulgaris[13], the treatment of mildly or moderately affected patients, that are not targets of aggressive systemic therapies, is still challenging. With its four key pathogenic factors of increased sebum production, alterations of the follicular keratinization processes, inflammation and colonialization of *Cutibacterium acnes*[8], a treatment should address as many of the pathogenic factors as possible. NO may here play a decisive role.[3] Our study clearly demonstrates an improvement in acne lesions over an eight-weeks treatment period. Using

this novel NO-producing gel formulation, all patients experienced a significant reduction of both inflammatory and noninflammatory lesions. No one reported major side effects. The overall product tolerability was defined as "excellent" by 70% of the subjects at the end of the treatment. This indicates a lower therapeutic burden. The observed effects may be due to the antibiotic effects of NO and the inflammatory-modifying impact on even preclinical inflammation by modifying the T helper cells activity as well as the inhibition of inflammatory cytokines like IL-8 and IL-6 as well as TNF-α.[3] An inhibition of caspases by NO leads to a suppression of NLRP3 inflammasome activity and thereby reduces the expression of IL-1β. NO furthermore reduces the T helper 17 cell activity via reduced expression of IL-17 and stimulation of regulatory T cells.[17–20] The effects of NO on the pathogenic factor of (hyper)keratinization are discussed controversially.[20,21] Effects of NO on acne vulgaris [3,17–20] are summarized in *Figure 5*.

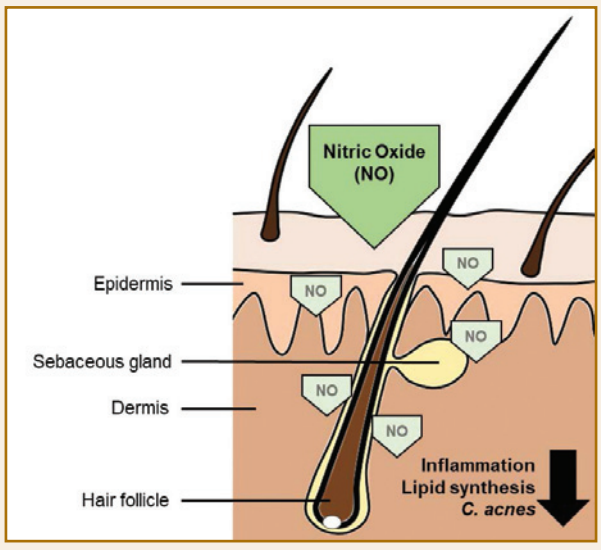

Figure 5. *Disease-modifying effects of nitric oxide (NO) on acne vulgaris. The antimicrobial activity leads to a reduction of Cutibacterium acnes colonization. It furthermore reduces inflammation and lipid synthesis, contributing to an improvement of acne vulgaris disease.*

The promising results of the clinical evaluation as cosmetic agent point towards a favorable use in beautifying as well as maintaining and protective effects and may, due to its physiological functions, increase collagen synthesis in fibroblasts to decrease wrinkle formation.[22] With its novel dual component mutual-activating stable-release formulation we see benefits over other NO-generating formulations.[6] It does not inherit the risk of methemoglobin formation like diazeniumdiolates, it is as easy to use as common geland serum-formulations and its applicability is not limited by technical limitations as seen in direct application of gaseous NO.

LIMITATIONS OF THE STUDIES

Of course, some limitations apply to our exploratory open-label pilot studies. Not designed with a placebo arm, the designs did not inherit a comparative trial of different therapeutic strategies in both studies, clinical evaluation for treatment of acne vulgaris as well as evaluation as a cosmetic agent. Eight weeks (acne vulgaris study) or four weeks (cosmetic evaluation) of observational period may be too short for long-term follow-up observation. Therefore, also because of the limited sample size, studies on larger patient populations should be performed. Nevertheless, the patient population as well as the proband population represent the common population presenting to general practitioners and dermatologists, resulting in a good external validity.

5. CONCLUSIONS

The NO gel-formulation is an innovative topical acne vulgaris treatment with a bimodal mode of action. It may perform its effects by inhibiting Cutibacterium agnes proliferation as well as restoring the skin's protective barrier and furthermore modifying inflammatory activity. Due to its excellent tolerability, it may reduce the therapeutic burden in acne vulgaris treatment. Furthermore, a NO-producing serum with increased fluidity seems to be beneficial in the aging skin population. Both novel formulations may exhibit benefits over other modes of application.

Author Contributions: Conceptualization, T.R., U.B.H. and I.S.; methodology, I.S.; investigation, all authors; resources, T.R., U.B.H. and I.S.; writing—original draft preparation, S.S. and I.S.; writing—review and editing, all authors; visualization, S.S. and I.S.; supervision, I.S. and T.R.; project administration, T.R.; All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: The study was conducted according to the guidelines for Good Clinical Practice [23] and the guidelines of the Declaration of Helsinki [24] and approved by the Institutional Ethics Committee of the Medical Faculty of the University of Duisburg-Essen (protocol code 20-9698-BO from 11/26/2020).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to data protection law.

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Conflicts of Interest: The authors declare no conflict of interest.

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JOURNAL OVERVIEW

The *Journal of Dermatology for Physician Assistants* (*JDPA*) is a peer-reviewed publication that delivers innovative clinical, surgical, cosmetic, and professional content exclusively for dermatology PAs. Submissions to the *JDPA* are peer-reviewed by a panel of experienced dermatology PAs, educational PAs, and dermatologists before being accepted for publication. Manuscripts submitted for publication are reviewed with the understanding that they are original and have neither been submitted elsewhere nor are being considered by other journals. Electronic submissions are accepted and should be sent to jdpa@dermpa.org.

JDPA follows the recommendations of the International Committee of Medical Journal Editors (ICMJE), the World Association of Medical Editors (WAME), and the Committee on Publication Ethics (COPE) for guidance on policies and procedures related to publication ethics. The policies submission requirements listed in *JDPA*'s Author Guidelines have been adopted from those three advisory bodies and, where necessary, modified and tailored to meet the specific content, audiences, and aims of *JDPA*.

EDITORIAL MISSION

The *Journal of Dermatology for Physician Assistants* (*JDPA*) is the official clinical journal of the Society of Dermatology Physician Assistants. The mission of the *JDPA* is to improve dermatological patient care by publishing the most innovative, timely, practice-proven educational information available for the physician assistant profession.

Manuscripts that meet our editorial purpose include, but are not limited to, original research pertaining to the field of dermatology and/or physician assistant education and practice, review articles on dermatological conditions and their treatments, case reports and studies, clinical pearls related to surgical and/or cosmetic procedures, commentaries on published literature, opinion essays on current issues, and letters to the editor.

CONTENT FOCUS

The main departments featured in *JDPA* are as follows:

- Clinical Dermatology
- Cosmetic Dermatology
- Dermatology PA News & Notes
- Professional Development
- Surgical Dermatology

Dedicated departments may comprise features or regular columns that highlight content specific to their subject matter.

JOURNAL STYLE

All aspects of the manuscript, including the formatting of tables, illustrations, and references and grammar, punctuation, usage, and scientific writing style, should be prepared according to the most current *American Medical Association (AMA) Manual of Style* (http://www.amamanualofstyle.com)

Author Listing. All authors' names should be listed in their entirety and should include institutional/professional affiliations and degrees held.

Authoring Groups. If you choose to include an organization, committee, team, or any other group as part of your author list, you must include the names of the individuals as part of the Acknowledgments section of your manuscript. This section should appear after the main text prior to your References section. (If your Acknowledgments includes both group members and other persons/organizations who are not in that group, you should instead list the group members in a separate appendix to avoid confusion.) The terms "for" or "on behalf of" must also be used when referencing the authoring group in the by-line.

Proprietary Products. Authors should use nonproprietary names of drugs or devices unless mention of a trade name is pertinent to the discussion. If a proprietary product is cited, the name and location of the manufacturer must also be included.

References. Authors are responsible for the accuracy of references. Citations should be numbered in the order in which they appear in the text. Reference style should follow that of the *AMA Manual of Style*, current edition. Abbreviated journal names should reflect the style of Index Medicus. Visit: http://www.nlm.nih.gov/tsd/serials/lji.html

Reference Formatting Guide

Journal article with 1 author
Zweibel K. Engineering. The impact of tellurium supply on cadmium telluride photovoltaics. *Science*. 2010;328(5979):699-701.

Journal article with more than 5 authors
Lim HW, Collins SAB, Resneck JS Jr, et al. The burden of skin disease in the United States. *J Am Acad Dermatol*. 2017 May;76(5):958-972.e2. Epub 2017 Mar 1.

Authored book
Griskey RG. *Transport Phenomena and Unit Operations*. Hoboken, NJ: John Wiley & Sons, Inc.; 2005.

Edited book
Cleophas TJ. *SPSS for Starters and 2nd Levelers*. 2nd ed. 2016. (Zwinderman AH, ed.). Cham: Springer International Publishing; 2016.

Book chapter
Worbs T, Förster R. T Cell Migration Dynamics Within Lymph Nodes During Steady State: An Overview of Extracellular and Intracellular Factors Influencing the Basal Intranodal T Cell Motility. In: Dustin M, McGavern D, eds. *Visualizing Immunity. Current Topics in Microbiology and Immunology*. Berlin, Heidelberg: Springer; 2009:71-105.

Website
Davis J. Soccer Players May Be At Risk Of Dementia From Repeatedly Heading The Ball. IFLScience. https://www.iflscience.com/health-and-medicine/soccer-players-may-be-at-risk-of-dementia-from-repeatedly-heading-the-ball/. Published February 15, 2017. Accessed October 30, 2018.

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MANUSCRIPT CATERGORIES

CLINICAL DERMATOLOGY

- ***Continuing Education (CME).*** Content should be specific to the field of dermatology following any of the following formats: Original research (clinical or basic science), Professional issues or health policy papers, Scholarly review of a topic. **Recommended content length:** up to 5,000 words not including references. **Requirements:** Learning Objectives (4), Statement explaining how the article addresses practice gaps, and Self-assessment post-test questions (4).
- ***Dermatology Case Report.*** Discuss a case(s) that illustrates an important or interesting observation. Cases should stimulate research and the exchange of information and illustrate the signs and symptoms, diagnosis, and treatment of a dermatological condition. At least 15 current references are recommended. Illustrative material is preferred. Must include abstract. (1,000 to 3,000 words).
- ***Clinical Dermatology PA Perspectives.*** A review of published article summarizing the practical thoughts and clinical issues (250-1000 words).
- ***From the Patient's Perspective.*** Patients' stories published in their own words. JDPA staff can even assist patients with writing their stories (250-1000 words).
- ***Clinical Snapshots.*** A brief written description and clinical facts about an interesting cutaneous anomaly (250-500 words).
- ***Drugs in Dermatology.*** Write about the current information regarding a particular dermatological medication, drug interaction, or medication side effect/adverse reaction (250-1000 words).
- ***Dermatology Evidence-Based Medicine (derm EBM).*** A brief, evidence-based assessment of the one or two most relevant studies retrieved to answer a focused clinical question that may have arisen from a real-life situation. A derm EBM is not a comprehensive review of a subject or a synthesis of all the available knowledge (500–1500 words).

COSMETIC DERMATOLOGY

- ***Feature Articles***. A review about a new or innovative cosmetic procedure, device, and/or approach to patient care (500-1000 words).
- ***Cosmetic Pearls***. A brief article on a fact or pearl for the cosmetic setting (250-500 words).
- ***Cosmetic Dermatology Case Report.*** Write a report and discuss a case(s) that illustrate an important or interesting observation (500-1500 words).
- ***Cosmetic Dermatology PA Perspectives.*** Write a review of published article summarizing the practical thoughts and clinical issues (250-1000 words).

COSMETIC DERMATOLOGY

- ***Feature Articles***. A review about a new or innovative cosmetic procedure, device, and/or approach to patient care (500-1000 words).
- ***Cosmetic Pearls***. A brief article on a fact or pearl for the cosmetic setting (250-500 words).
- ***Cosmetic Dermatology Case Report.*** Write a report and discuss a case(s) that illustrate an important or interesting observation (500-1500 words).
- ***Cosmetic Dermatology PA Perspectives.*** Write a review of published article summarizing the practical thoughts and clinical issues (250-1000 words).

DERMATOLOGY PA NEWS AND NOTES

- ***Feature Articles***. A review of a new or innovative dermatological procedure, device, and/or approach to patient care (500-1000 words).
- ***From The Desk Of…***Write an opinion essay sharing your insight regarding a current "hot item" issue (e.g., specialty PA credentialing, dermatology access to care, supervising physician relationships, etc.) or any other topic regarding the field of dermatology (250-1000 words).

PROFESSIONAL DEVELOPMENT

- ***Feature Articles.*** An article that explores the professional issues dermatology PAs face, such as reimbursement, education, medical trends, contracts, office management, etc. (500-1500 words).
- ***Outside & Inside the 9 to 5***. Share your story of the good work that you do either outside or inside your practice of dermatology. (250-1000 words).
- ***Notes From Your Office Manager***. A brief article on a fact or pearl for the office setting (250-500 words).
- ***Judicial and Ethical Affairs.*** An article that explores the complex or multifaceted ethical or judicial professional issues that affect the practice of dermatology for PAs (250-1000 words).

SURGICAL DERMATOLOGY

- ***Feature Articles***. A review about a new or innovative surgical procedure, device, and/or approach to patient care (500-1000 words).
- ***Surgical Wisdom***. A brief article on a fact or pearl for the surgical setting (250-500 words).
- ***Surgical Dermatology Case Report.*** A report discussing a case(s) that illustrates an important or interesting observation (500-1500 words).
- ***Surgical Dermatology PA Perspectives.*** Write a review of published article summarizing the practical thoughts and clinical issues (250-1000 words).

SUBMISSION GUIDELINES & INSTRUCTIONS

All submissions must adhere to the following format:

- Main Submission Document prepared in Microsoft Word (no PDFs) or similar word processing program
- Font: Times New Roman font, size 12, black
- Formatting: Use double spacing throughout
- Do not include footnotes within the manuscript body
- All abbreviations and acronyms should be spelled out at first mention.

E-mail Your Manuscript to: jdpa@dermpa.org

Note: Hard copies are not accepted

JDPA MANUSCRIPT PREPARATION CHECKLIST

✓ **TITLE PAGE**

Author listing. Full names for all authors, including degrees, and institutional/professional affiliations.
Corresponding author. The name and contact information of the corresponding author should also be included. This is the individual designated to communicate with the editorial staff regarding the manuscript.
Word Count. List main body word count (Do not include references and supplementary material).
Abstract. Include a structured abstract with all articles, except letters to the editors. Abstracts should be limited to 250 words and summarize the manuscript's main points (e.g., a research article might contain the following abstract categories: objective, design, setting, participants, measurements, results, conclusion.
Keywords. Include any search terms relevant to the manuscript content.
Disclosures. Include a any relevant disclosures, such as financial support, industry relationships, or other conflicts of interest.

✓ **FIGURES, TABLES, & SUPPLEMENTAL MATERIAL**

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***Figures*.** Authors should number figures in the order in which they appear in the text. Figures include graphs, charts, photographs, and illustrations. Each figure MUST include a legend.

***Tables*.** Tables should be numbered in the order in which they are cited in the text and include appropriate headers. Table formatting should follow the current edition of the *AMA Manual of Style*. Tables should be constructed using a Microsoft Word program and inserted in numerical order at the end of the manuscript, either within the main Word document (following the references) or as separate files. Do not provide tables in scan/image format.

Supplemental Material. References to any online supplemental information must appear in the main article. Such supplemental information can include but are not limited to additional tables, figures, videos, audio files, slide shows, data sets (including qualitative data), and online appendices. If your study is based on a survey, consider submitting your survey instrument or the key questions as a data supplement. Authors are responsible for clearly labeling supplemental information and are accountable for its accuracy. Supplemental information will be peer reviewed, but not professionally copyedited.

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- InCyte Dermatology C2

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