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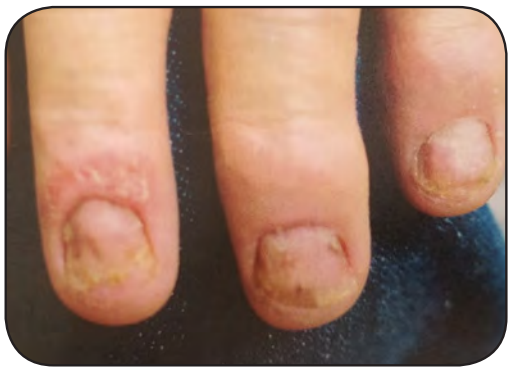
JDPA

Journal of Dermatology for Physician Assistants



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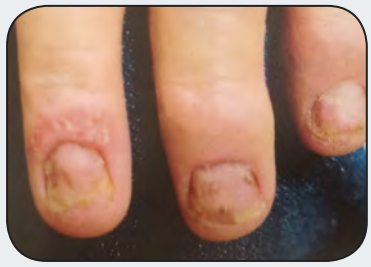

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SDPA2021

SDPA conferences are recognized as the premier educational and networking venues for dermatology PAs.

How 2020 Taught Us to See Opportunity through Obstacle

"The impediment to action advances action.
What stands in the way becomes the way."

--Marcus Aurelius

This philosophical quote from the stoic philosopher and Roman emperor Marcus Aurelius has resonated a lot with me this past year. All through the pandemic, whether parenting my own children, working with graduate students in the physician assistant (PA) program I teach at, or caring for my patients, I have found myself continuously trying to help them to see a way forward when problems seemed to keep piling up one after another. I encouraged them all to try not to dwell on the obstacles that they were faced with, but rather on how they could adjust their own attitudes toward them and find the support and encouragement from others needed to forge ahead confidently and successfully.

As dermatology PAs, we have dedicated our careers to the institution of healthcare. Our community took tremendous steps forward in adjusting our attitudes to what seemed like insurmountable obstacles, and we have forged ahead. I think of our colleagues who created the new flow of their clinics to safely accommodate patients, those who helped to take part in assisting other specialties outside of dermatology, and those who adapted by providing telemedicine visits. Making these adjustments was not easy, but with renewed attitudes of determination, gratitude, and optimism, we were able to continue to provide care for the patients who were in need. This was huge. The obstacles did not stop our progress but rather allowed for us to discover new and innovative ways forward.

I'm proud to say that the editorial staff of the Journal of Dermatology for Physician Assistants (JDPA) also worked with the "impediment to action" by shifting editorial planning directly to that obstacle. We began brainstorming the ways in which the COVID-19 pandemic was affecting dermatology PAs across the country. We sought insight from long-time JDPA contributor James A. Van Rhee, an expert in delivering PA education online. Other talking points brought to the forefront in JDPA editorial content included awareness surrounding dermatological manifestations of COVID, wide adoption of telemedicine, and sharing stories from dermatology PAs on the frontlines of pandemic response. Perhaps the most visible example of the journal's innovative spirit in 2020 was the launch of a fully interactive digital version of the JDPA Fall 2020 issue, which became a perfect complement to Society of Dermatology Physician Assistants' (SDPA) virtual conference experience, SDPA Digital 2020. Moving the journal and an in-person scientific conference to digital platforms was no easy feat and is a prime example of how the obstacles were overcome and became "the way."

While 2021 will undoubtedly continue to present us all with new obstacles, we can continue to apply the lessons learned from this past year and respond to each with adjusted attitudes. We as humans have it in us to turn any situation, no matter how bad, into an opportunity for us to apply the virtues of determination, gratitude, and optimism, and see a way forward.

Sincerely,

Travis Hayden

Travis Hayden, MPAS, PA-C
JDPA Founding Editor
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- **November**: Nominations for Elected Office
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Questions can be referred to membership@dermpa.org

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.

AAD Virtual Meeting Experience (VMX)
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2021 Society for Investigative Dermatology (SID) Virtual Meeting
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November 4-7, 2021
InterContinental Hotel
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https://www.dermpa.org

FROM THE PRESIDENT'S DESK:

Hindsight is 2020: Unpacking Lessons Learned in the New Year

Dear Colleagues,

Welcome to 2021! There is something about new beginnings that energizes us. I know many of us will be unpacking the lessons we learned in 2020 throughout 2021 and for years to come. It brings new meaning to the phrase "hindsight is 20/20."

From an organizational standpoint, 2020 forced Society of Dermatology Physician Assistants (SDPA) to look at how we deliver education to our members. Since our inception, the SDPA has primarily depended on live, in-person meetings to deliver continuing medical education (CME). In recent years, in addition to the Diplomate Fellowship program, we have offered full video recordings of SDPA conferences and webinar series in both live and on-demand formats.

At the end of 2020, we launched the new SDPA online Learning Center. This new online education resource features improved stability and ease-of-use, as well as additional enhancements. Keep checking our learning center platform for updated offerings, such as a new Professional Development series scheduled to launch in Spring 2021.

The SDPA leadership continues to innovate new ways to stay connected and bring value to you—our member colleagues. In addition to the new Professional Development series, we are hard at work on other remote engagement opportunities that you are sure to enjoy! Stay tuned for further details.

A valuable lesson learned in 2020 was that the need and demand for increased distance education offerings will continue We are confident in our ability to deliver this as we reflect on the success of our Fall 2020 conference, SDPA Digital 2020, which took place completely in the virtual setting. With more than 850 attendees, was the highest attended conference in SDPA history!

While we honed our skills connecting and communicating online in 2020, we sense (and share) an eagerness to get back to living and learning together live and in person! That's why the SDPA Annual Summer Dermatology Conference 2021 will be a hybrid conference, giving you the choice to participate however you feel comfortable—in-person July 22 to 25, 2021, in Chicago, Illinois; virtually (live streamed from Chicago); or on-demand following the event. Whichever method in which you choose to participate, we look forward to "seeing" you. Visit https://www.sdpaconferences.org/Summer2021 for more details and to register.

The beginning of each new year is known as a time of making resolutions. I challenge you this year to not make resolutions but rather to live a life of resolve—a life governed by determination and grit to be the best version of yourself. The SDPA will continue to innovate new and improved ways to add value to the derm PA community.

With you and for you,

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

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Making Sense of the Expanding Class of Biologics: A Focus on Nail Psoriasis

By Pamela Korzeniowski, PA-C

ADDRESSING PRACTICE GAPS

This manuscript addresses practice gaps in treatment by reviewing the most up-to-date studies on nail psoriasis (in particular the IXORA-S research study, published in March 2020), discussing how nail psoriasis will have different clinical presentations depending on which structure of the nail is involved, reviewing which first-line treatment options are most efficacious depending on the nail structure involved, and simplification of the decision-making process with biologics by organizing in concise table forms all the biologics currently approved for psoriasis and psoriatic arthritis.

» CME

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.

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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. *Identify clinical features that differentiate psoriasis affecting the nail matrix versus the nail bed.*
2. *Review which first-line treatment options are most efficacious depending on the nail structure involved.*
3. *Review of the biologics currently approved for psoriasis in the United States.*
4. *Review current research concerning efficacy of IL-inhibitors in the treatment of nail psoriasis.*

ABSTRACT

This article reviews the different clinical presentations of nail psoriasis depending on which nail structure is involved, discusses which first-line treatments are most efficacious depending on the nail structure involved, and highlights the biologic therapies that stand out as superior in newer nail psoriasis studies. The expanding class of biologics and their associated nuances can be overwhelming when determining which is the best fit for a specific psoriasis patient; thus, this manuscript as well aims to reduce confusion related to biologics by presenting a brief history of biologics, providing a review of the current biologics approved for psoriasis and psoriatic arthritis in the United States, along with a concise set of tables to help simplify decision-making with biologics.

KEYWORDS

psoriasis (PsO), nail psoriasis, biologic therapy, tumor necrosis factor (TNF) inhibitors, interleukin (IL) inhibitors, apremilast, adalimumab, brodalumab, certolizumab pegol, etanercept, golimumab, guselkumab, infliximab, ixekizumab, risankizumab-rzaa, secukinumab, tildrakizumab-asmn, ustekinumab

INTRODUCTION

Brief history of biologics and understanding of psoriasis. Despite the ability to achieve complete or near-complete clearance of psoriasis in the majority of psoriatic patients with a biologic, one subtype of psoriasis, nail psoriasis, has remained challenging to treat in some patients.[1] Nail psoriasis is easily visible and, especially when severe, has a devastating impact on the patient's quality of life (QOL).[1] Patients with moderate to severe nail psoriasis complain of pain, inability to grasp small items, fasten buttons or tie shoelaces, and have increased risk for secondary fungal and bacterial infections of the nails and fingers. Biologics have had some of the best results with nail psoriasis, but nail improvement tends to lag up to one year from initiation of a biologic and often does not completely clear the nail psoriasis.[1,2] Prior to the 1990s, psoriasis was considered simply a disorder of

keratinocytes.[3] Advances in immunology and molecular biology revealed psoriasis to be a much more complex, T-cell mediated disease.[3] Psoriasis is now known to be an inflammatory, immune-mediated, and chronic multisystem disorder that affects 1.5 to 3.6 percent of the North American population.[4] The primary manifestation of psoriasis is psoriatic plaques on the skin that can be pruritic, painful, and cosmetically distressing. Psoriasis is associated with numerous comorbidities, including psoriatic arthritis, cardiovascular disease, cancer, obesity, and psychiatric disorders.[4]

In the late 1990s, developments in the capacity for labs to identify and produce protein antibodies directed at specific cytokines and an improved understanding of the cellular and molecular pathogenesis of autoimmune inflammatory diseases converged into a brave new world of biologic therapies for autoimmune disorders such as rheumatoid arthritis (RA), Crohn's disease, psoriatic arthritis (PsA), ankylosing spondylitis (AS), and multiple sclerosis (MS).[3] Many of these autoimmune inflammatory conditions have overlapping molecular mechanisms, and so the development arcs for treatments have sometimes overlapped.[3] Tumor necrosis factor (TNF) inhibitors were the first widely successful biologics on the market, initially approved in 1998 for Crohn's disease (infliximab) and RA (etanercept).[3,5,6] These same drugs were approved within several years for PsA and psoriasis. More TNF inhibitors for psoriasis and PsA followed, up until the most recently approved TNF inhibitor, golimumab, released in 2009.[9] Interleukin (IL) inhibitors were first introduced in 2009 with ustekinumab, an IL-12/23 inhibitor.[10] The next group of IL inhibitors, the IL-17s, first appeared in 2015 with secukinumab.[11] The introduction of the first IL-23 inhibitor (guselkumab) came in 2017.[14] While there is 20-plus years of data on the TNF inhibitors, the IL inhibitor drugs are relatively new, and thus less data are available for these. However, the newer biologics have fewer expected side effects due to their more downstream-specified cytokine target.[17] Biologics, which receive this title because they are created from living cells in a lab or via a biological process, are not the only immune-targeting drugs now available to treat psoriasis and related autoimmune conditions.[17] Small molecule immune-targeted drugs such as apremilast, a phosphodiesterase-4 inhibitor (PDE4) and tofacitinib, a janus kinase (JAK) inhibitor, have also been developed, targeting other immune cells that in turn inhibit various inflammatory responses in the immune system.[1] With the multitude of immune-targeted therapies on the market or soon to be on the market, considering which treatment option is best for a patient can become overwhelming. This article focuses on the nuances of the biologics alone, particularly in the treatment of nail psoriasis.

SAFETY CONCERNS OF BIOLOGICS

Biologics share the following safety concerns: serious infections (mainly with infliximab, the oldest of the TNF inhibitors), hepatitis B and C virus (HBV/HCV) reactivation, interstitial pneumonia, immunogenicity (failure to respond, loss of response and/or anti-drug antibodies), and increased risk of some malignancies (primarily skin and lymphoma).[18] Biologics should be avoided during pregnancy and should not be used if the patient has active infection. Live vaccines need to be updated prior to initiation of a biologic.[5-16]

Specific TNF inhibitor concerns. While TNF inhibitors have demonstrated a good safety profile over more than 20 years, they do carry some safety concerns that should be considered when selecting a treatment plan for a particular patient. First, TNF-alpha plays an important role in immune control of mycobacterium (particularly *Mycobacterium tuberculosis* [TB]), and so it is critical to screen patients for TB prior to initiation of a TNF inhibitor.[18] A patient found to have latent TB infection (LTBI) needs to be treated before initiating a TNF inhibitor.[18] Also, more common with TNF inhibitors are paradoxical reactions, Lupus-like reaction, and infusion-reaction with infliximab.[18] TNF inhibitors are contraindicated for class III or IV heart failure patients.[18]

Specific IL-12/23 inhibitor concerns. The first IL inhibitor approved for use in the United States in 2009 was the IL-12/23p40 antibody, ustekinumab, which was then approved for psoriasis and PsA in 2013.[8] Some concern for serious salmonella infections and cases of posterior leukoencephalopathy syndrome have been reported with ustekinumab.[18] Possibly associated with increased risk for major adverse cardiovascular events (MACE) in early studies; however, further research has not reinforced this finding.[18]

Specific IL-17 inhibitor concerns. Interleukin-17 has a significant role against infections, particularly those due to *Candida* species.[18] Almost all *Candida* infections associated with IL-17 inhibitor treatment have been mucocutaneous, mild to moderate in severity, and did not require the patient to stop treatment.[18] IL-17s should be avoided in patients who have known inflammatory bowel disease (IBD) or a strong family history of IBD and patients should be monitored for IBD-like symptoms after initiating treatment with an IL-17.[18] Neutropenia can occur but is rare and usually mild if it occurs; periodic monitoring for neutropenia is

recommended.[18] Brodalumab was associated with three suicide attempts, and one completion, during its Phase 3 studies; however, no other IL-17 inhibitors have been associated with depression or suicide attempts.[18]

See *Tables 1 and 2* for a complete listing and special considerations for usage of approved TNF-inhibitor and IL-inhibitor biologics for psoriasis and/or psoriatic arthritis.

NAIL PSORIASIS

Special challenges. While biologics have made safe and complete clearance of psoriasis an achievable goal of treatment, nail psoriasis has continued to be more challenging.[19] Part of the challenge is that patients who have severe nail disease more often have PsA, and patients who have PsA often have more severe psoriasis.[3, 19] While the most common form of psoriasis is plaque psoriasis, the prevalence of nail psoriasis in patients with plaque psoriasis is well over 50 percent, with estimated lifetime incidence of 80 to 90 percent.[19] In patients with PsA, the incidence of nail psoriasis may be more than 80 percent.[19] Nail psoriasis is considered an indicator for future development of PsA.[19] Studies have indicated that up to 42 percent of psoriasis patients will develop psoriatic arthritis (PsA) over the course of their disease.[20,21] Because psoriasis and PsA share common pathophysiologic mechanisms, the majority of patients with PsA also have psoriasis.[20] PsA presents with pain, stiffness, and swelling in and around the joints, similar to other rheumatologic diseases. Distinguishing features of PsA include seronegativity for rheumatoid factor, enthesitis (heel pain at the insertion of the Achilles tendon is a classic finding), dactylitis, spondylitis, and dystrophic nail changes.[20] Nail psoriasis poses a particular challenge due to the small surface area of the nails, the anatomy of the nail, and frequent injury or irritation to fingertips from regular use of the hands.[1,19] Nail psoriasis can be especially devastating to patients as it is readily visible to others, leading to emotional distress, loss of job opportunities, social ostracization, and impairment of a person's ability to pick up small items or do fine work with the hands.[1,19] Even when a patient with plaque psoriasis is successfully treated with a biologic drug, his or her nail psoriasis takes much longer to improve.[18]

Different presentations of nail psoriasis. Psoriatic nail disease will have different presentations depending on the structure involved within the nail.[19] When present in the nail matrix, it can cause pitting, leukonychia, red spots of the lunula, Beau's lines, and crumbling of the nail plate.[19] Psoriasis affecting the nail bed will present as oil-drop discoloration (also known as oil spots), splinter hemorrhages involving the distal third of the nail, subungal thickening, and onycholysis to loss of the nail.[18] Psoriasis can also cause chronic psoriatic paronychia, via involvement of the periungal region of the nail.[19] Signs of nail psoriasis are not exclusive to psoriasis and may be seen in other nail conditions, however, in most cases, the diagnosis of nail psoriasis can be made clinically.[18]

Nail psoriasis treatments. Conventional systemic treatments, including methotrexate, cyclosporin, acitretin, and apremilast as well as intralesional steroids, calcipotriol, tacrolimus and tazarotene, have been shown to have some efficacy for treatment of nail psoriasis, mainly in mild cases.[1,19] Topical and intralesional steroids seem to work better on nail matrix involvement whereas calcipotriol has better effect on nailbed psoriasis.[19] In 2019, the *Journal of the American Academy of Dermatology* published a dermatologist and nail expert group consensus by Rigopoulos et al.[22] This group consensus concluded that with nail psoriasis affecting three or more nails, systematic treatment should be considered including acitretin, methotrexate, cyclosporin, small molecules and biologics; whereas if three or fewer are affected, topicals could be offered first.[22] While most biologic studies have only included nail psoriasis as a secondary focus, all biologics from TNF inhibitors to IL-22/23 inhibitors have shown a slow but good effect for nail psoriasis.[19, 22] Non-pharmacologic treatments including phototherapy, photodynamic therapy, laser therapy, and radiotherapeutic options are sometimes used but not considered first-line treatments.[19]

REVIEW OF THE LITERATURE

Most significant studies on biologic treatment for nail psoriasis. One of the limiting factors in many nail psoriasis studies is that nail involvement was often considered as a secondary endpoint.[19] Another problem is that the severity of the nail psoriasis was not measured using a universal measurement. For example, the most commonly used scoring system, The Nail Psoriasis Severity Index (NAPSI), can be measured differently depending on how the study was set up. Usually, each fingernail is assigned a total possible score of 8: up to 4 points for the nail plate if all four quadrants are affected, and up to 4 points for the nail matrix if all quadrants are affected, making a maximum score of 80 for all 10 fingernails.[19] Some studies included the toenails as well (with total score of 160).[19] Other studies used a "target NAPSI," where only the most severe nail is treated.[19] Alternatively, some researchers opted to use target NAPSI scores (NAPSI-50, NAPSI-75, and NAPSI-90) to represent the percentage of patients that achieved

NAPSI of 50, 75 or 90, respectively.[19] Although the original NAPSI score does not always correspond well between studies, the NAPSI and the modified NAPSI (mNAPSI) have been adopted more often over time.[19] Rigopoulos et al[22] compared a number of nail psoriasis studies that used NAPSI and mNAPSI to measure nail psoriasis improvement with various biologics including infliximab, adalimumab, ustekinumab, secukinumab, and ixekizumab.[1] As a whole, each biologic reviewed showed good to excellent improvement in nail psoriasis despite lack of direct comparability using various NAPSI scoring systems.[1]

In 2020, Wasel et al reported results of their IXORA-S trial, a study comparing ixekizumab and ustekinumab, to examine efficacy in nail psoriasis. IXORA-S was a 52-week, phase 3b, multicenter, double-blinded, head-to-head, randomized trial with 302 patients.[2] For both the ixekizumab and ustekinumab arms, over 60 percent of the patients had significant fingernail psoriasis at baseline (defined in the study as NAPSI > 16 with > 4 fingernails involved).[2] Significantly more patients had nail psoriasis clearance (NAPSI = 0) by Weeks 16 to 20 in the ixekizumab group.[2] While the patients in the ixekizumab group had faster results, both the ixekizumab and ustekinumab groups nail and skin psoriasis continued to improve over the 52 weeks.[2]

Based on the IXORA-S study, ixekizumab stands out as one of the most efficacious biologics for nail psoriasis. It is important to note, however, that both ustekinumab and ixekizumab performed well, while ixekizumab showed clearance of nail psoriasis several weeks faster than ustekinumab.[2] At the end of the 52 weeks, only 21.5 percent of the patients from the ustekinumab arm and 7.8 percent of patients from the ixekizumab arm continued to present with significant nail psoriasis.[2] The older studies on biologics and nail psoriasis have also showed good efficacy[1] though less impressive than results from the more recent IXORA-S study.[2] One limitation in comparing prior studies on the usage and efficacy of biologics for the treatment of nail psoriasis is that scoring systems and study design varies widely.

Table 3 summarizes the major studies evaluating biologics in the treatment of nail psoriasis and lists NAPSI improvement results.

DISCUSSION

The best biologic for nail psoriasis depends on the patient's particular health history, comorbidities, physical exam, past treatments, and patient preferences. Whichever biologic fits your patient's needs the best is likely the best for that patient. According to the available literature, all biologics, including TNF inhibitors, IL-17 inhibitors, and the IL-12/23 inhibitor, have shown to be effective in treating nail psoriasis. Given the connection between nail psoriasis and psoriasis, clinicians can conclude that most systemic treatments, which have proven effective for PsA or psoriasis, will also treat nail psoriasis. At the time this manuscript was written, the most recent IXORA-S study showed that the IL-17 inhibitor ixekizumab worked faster in clearing nail psoriasis for the majority of participants.

CONCLUSION

Biologic therapies have been shown to be safe and effective in the treatment of psoriasis and related inflammatory autoimmune conditions. When determining whether a patient with severe nail psoriasis would benefit from a biologic, the clinician should consider the patient's health history, family history, and personal preferences to treatment to the individual. Nail psoriasis often presents with other related conditions, such as psoriasis and PsA, so the clinician might also recommend a biologic with secondary benefits for the patient. For instance, the clinician might recommend a biologic therapy that also treats PsA if the patient displays symptoms suggestive of early PsA, then carefully re-review the patient's history to reasonably ensure against conflicts between the biologic in question and the patient's other health conditions. With biologics currently at the forefront of treatment and on the horizon, it is critical for dermatology clinicians to stay up to date on these and other immune-modulating drugs as they emerge.

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TABLE 1. FDA-approved TNF inhibitor biologics for psoriasis and/or psoriatic arthritis.

TNF Inhibitor	FDA Approval	Route and Frequency	Common Precautions	Special Concerns for Which to Monitor
infliximab *(Remicade[5] Janssen Biotech)*	1998 – Crohn's 2005 – PsA 2006 – PsO	IV infusion PsO & PsA: Week 0, 2, and 6, then every 8 weeks	Screen for TB, HCV/HBV prior to initiation and monitor periodically afterward TB endemic areas Avoid in Class III&IV HF, MS, active infection, and pregnancy Avoid live vaccines	Serious infection Fungal infection New or worsening heart failure Serious allergic reaction, infusion reaction Hepatitis B reactivation CNS demyelinating disease, peripheral neuropathy Low blood count Lupus-like syndrome Lymphoma and other malignancies
etanercept *(Enbrel[6] Amgen Inc.)*	1998 – RA 2002 – PsA (adults) 2004 – PsO (over age 4)	SQ self-injection Adult/Ped PsO: Twice weekly for 3 months, then once weekly Adult/Ped PsA: Once weekly	Screen for TB and HCV/HBV prior to initiation and monitor periodically afterward TB endemic areas Avoid in Class III&IV HF, MS, active infection, and pregnancy Avoid live vaccines	Serious infection Fungal infection CNS demyelinating disease, peripheral neuropathy Lymphoma New or worsening heart failure Low blood count Hepatitis B reactivation Serious allergic reaction Lupus-like syndrome
adalimumab *(Humira[7] AbbVie Inc.)*	2002 – RA 2005 – PsA 2008 – PsO 2017 – Moderate to Severe Nail Psoriasis	SQ self-injection PsO & PsA: Once every other week	Screen for TB, HCV/HBV prior to initiation and monitor periodically afterward TB endemic areas Avoid in Class III&IV HF, MS, active infection, and pregnancy Avoid live vaccines	Serious infection Fungal infection CNS demyelinating disease, peripheral neuropathy Lymphoma New or worsening heart failure Low blood count Hepatitis B reactivation Serious allergic reaction Lupus-like syndrome
certolizumab *(Cimzia[8] UCB, Inc.)*	2008 – Crohn's 2013 – PsA 2018 - PsO	SQ self-injection PsO & PsA: Week 0, 2 and 4, then every other week	Screen for TB, HCV/HBV prior to initiation and monitor periodically afterward TB endemic areas Avoid in Class III&IV HF, MS, active infection, and pregnancy Avoid live vaccines	Serious infection Fungal infection CNS demyelinating disease, peripheral neuropathy Lymphoma New or worsening heart failure Low blood count Hepatitis B reactivation Serious allergic reaction Lupus-like syndrome
golimumab *(Simponi and Simponi Aria[9] Centocor, Inc.)*	2009 – RA, PsA, and AS 2017 (Aria) – RA, PsA & AS	SQ self-injection PsA & AS: monthly IV infusion PsA & AS: Week 0 and 4, then every 8 weeks	Screen for TB, HCV/HBV prior to initiation and monitor periodically afterward TB endemic areas Avoid in Class III&IV HF, MS, active infection, and pregnancy Avoid live vaccines	Serious infection Fungal infection CNS demyelinating disease, peripheral neuropathy Lymphoma New or worsening heart failure Low blood count Hepatitis B reactivation Serious allergic reaction Lupus-like syndrome

Abbreviations: *PsO: psoriasis; PsA: psoriatic arthritis; RA: rheumatoid arthritis; AS: ankylosing spondylitis; TNF: tumor necrosis factor; IV: intravenous; SQ: subcutaneous; FDA: United States Federal Drug Administration; HF: heart failure; MS: multiple sclerosis*

TABLE 2. FDA-approved Interleukin-inhibitor biologics for psoriasis and/or psoriatic arthritis.

Interleukin Inhibitor and Target	FDA Approval	Route and Frequency	Common Precautions	Special Concerns for Which to Monitor
ustekinumab *(Stelara[10] Janssen Biotech)* **IL-12 & 23**	2009 – PsO 2013 – PsA	SQ self-injection PsO & PsA: Week 0, 4, then every 12 weeks	Screen for TB prior to initiation Avoid in active infection and pregnancy Avoid live vaccines	Serious infection Reversible Posterior Leukoencephalopathy Syndrome (PRES) Major Cardiovascular Event (MACE) Malignancies
secukinumab *(Cosentyx[11] Novartis)* **IL-17A**	2015 – PsO 2016 – PsA & AS	SQ self-injection PsO, PsA, AS: Week 0, 1, 2, 3, 4, then every 4 weeks	Screen for TB prior to initiation Avoid in IBD, active infection, and pregnancy Avoid live vaccines	Serious infection IBD-like symptoms
ixekizumab *(Taltz[12] Eli Lilly and Co.)* **IL-17**	2016 – PsO 2017 – PsA	SQ self-injection PsO: Week 0 and every 2 weeks for 3 months, then every 4 weeks PsA: Week 0, 4, then every 4 weeks	Screen for TB prior to initiation Avoid in IBD, active infection, and pregnancy Avoid live vaccines	Serious infection IBD-like symptoms
brodalumab *(Siliq[13] Bausch Health Companies)* **IL-17 receptor**	2017 – PsO	SQ self-injection Week 0, 1, 2, then every 2 weeks	Screen for TB prior to initiation Avoid in active infection and pregnancy Avoid live vaccines	Suicidal ideation and behavior Serious infection IBD-like symptoms
guselkumab *(Tremfya[14] Janssen Biotech)* **IL-23**	2017 – PsO 2020 – PsA	SQ self-injection Week 0, 4, then every 8 weeks	Screen for TB prior to initiation Avoid in active infection and pregnancy Avoid live vaccines	Serious infection
tildrakizumab-asmn *(Ilumya[15] Sun Pharmaceutical Industries)* **IL-23**	2018 – PsO	SQ injection by health care provider Week 0, 4, then every 12 weeks	Screen for TB prior to initiation Avoid in active infection and pregnancy Avoid live vaccines	Serious allergic reaction Serious infection
risankizumab-rzaa *(Skyrizi[16] AbbVie Inc.)* **IL-23**	2019 – PsO	SQ self-injection Week 0, 4, then every 12 weeks	Screen for TB prior to initiation Avoid in active infection and pregnancy Avoid live vaccines	Serious infection

Abbreviations: *PsO: psoriasis; PsA: psoriatic arthritis; RA: rheumatoid arthritis; AS: ankylosing spondylitis; IV: intravenous; SQ: subcutaneous; FDA: United States Federal Drug Administration; IBD: inflammatory bowel disease.*

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TABLE 3. Major studies with biologics in the treatment of nail psoriasis

Study	Drug	Patients	Results Summary
Rich et al,[23] 2008	infliximab	305	Decrease of NAPSI was 26.8% at Week 10 and 57.2% at Week 24
Van den Bosch et al,[24] 2010	adalimumab	442	At Week 12, the median reduction in the NAPSI score was 57%
Thaçi et al,[25] 2015	adalimumab	730	Decrease from baseline NAPSI at Week 16 of 39.5%
Elewski et al,[26] 2019	adalimumab	217	At Week 26 to Week 52, total fingernail mNAPSI 75 improvement was 47.4 to 54.5%
Rich et al,[27] 2014	ustekinumab	766	Improvements in NAPSI ranged from 29.7 to 57.3%
Reich et al,[28] 2019	secukinumab	198	Secukinumab 300mg demonstrated the highest efficacy with nearly 50% improvement of total fingernail NAPSI at16 weeks
Augustin et al,[29] 2019	secukinumab	904	At baseline, 33.3% of PsO patients had nail involvement, and at Year 1, only 15.6% patients were affected by nail PsO
Van de Kerkhof et al,[30] 2017	ixekizumab	1,346	At Week 60, mean percent NAPSI improvement was >80%, regardless of initial treatment
Wasel et al,[2] 2020	ixekizumab versus ustekinumab	302	Statistically significantly more patients with NAPSI = 0 by Weeks 16-20 with ixekizumab. At Week, 52 patients who still presented with significant nail psoriasis were 7.8% (IXE arm) and 21.5% (UST arm).

Abbreviations: *NAPSI: Nail Psoriasis Severity Index; mNAPSI: modified NAPSI; PsO: psoriasis; IXE: ixekizumab; UST: ustekinumab.*

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Pamela Korzeniowski, PA-C, *is a dermatology physician assistant with North Texas VA Dermatology and practices in Dallas and Fort Worth, Texas. She is a graduate of the University of Washington MEDEX Northwest PA program in Seattle, WA, and a current DMSc student at A. T. Still University. She is a founding member of the North Texas VA PA Committee which champions PA issues within the North Texas VA system and has served as the committee secretary since 2017. She enjoys bringing PAs together through teamwork on PA-led projects, and most of all spending time with her children and husband.*

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Address for correspondence: *pbaxterj@gmail.com*

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Severe Nail Psoriasis: A Case Report

By Pamela Korzeniowski, PA-C

ABSTRACT

Treatment of severe nail psoriasis poses a particular challenge due to the anatomy of the nail, small surface area involved, and frequent irritation to fingertips from use of the hands.[1,2] Nail psoriasis can be particularly devastating to affected patients as it is easily visible, leading to emotional distress, potential social ostracization and loss of work opportunities and loss of function with performing fine work with the hands.[1,2] Being aware of which nail manifestations will present clinically depending on the nail structure affected by psoriasis, which first-line treatments are most efficacious, and when to consider systemic treatments can help guide treatment based on a patient's preferences and other health conditions

KEYWORDS

psoriasis (PsO), nail psoriasis, biologic therapy, tumor necrosis factor (TNF) inhibitors, interleukin (IL) inhibitors, apremilast, intralesional Kenalog injections (ILK), ixekizumab, acitretin, methotrexate

INTRODUCTION

Nail psoriasis, even when the primary clinical presentation in a psoriasis patient, is considered severe enough to think about systematic treatment, including acitretin, methotrexate, cyclosporin, small molecules, and biologics, when three or more nails are affected.[1] Most patients with nail psoriasis will experience some improvement of their nail psoriasis with most systemics, however, the improvement is typically seen after 3 to 6 months or longer, and complete clearance may not occur even after more than one year of treatment.[1,2] When three or fewer nails are affected, topicals, including calcipotriol, tacrolimus, tazarotene, high potency topical steroids, and injectable corticosteroid therapy can be offered first. These have been shown to have some efficacy for nail psoriasis, especially in mild cases.[2] Topical steroids and injectable corticosteroid therapy seem to work better on nail matrix involvement, whereas calcipotriol has been shown to have better effect on nailbed psoriasis.[2] Laser and phototherapy has been used with some success in nail psoriasis as well, but studies on these have been small and have shown inconsistent efficacy.[2]

CASE DESCRIPTION

Presentation. A 73-year-old Caucasian man presented to dermatology with a 2.5-year history of biopsy-confirmed plaque psoriasis (~5% total body surface area [TBSA] at time of diagnosis) well controlled with topical triamcinolone 0.1% ointment and nail psoriasis involving the bilateral thumbnails and the left third fingernail, previously well controlled with topical clobetasol ointment Mondays through Fridays and treatment with triamcinolone acetonide injectable suspension, USP (Kenalog® Bristol-Myers Squibb Company) every 4 to 6 weeks. He reported worsening nail psoriasis after a 10-month hiatus from the clinic. The patient had previously not been interested in systemics for his nail or plaque psoriasis as he was happy with the results seen with Kenalog® injections and topical steroids for the three affected nails, and his plaque psoriasis was mild and not bothersome to him.

Patient History. Two years prior to presentation, the patient had been treated for onychomycosis of bilateral thumbnails, left index finger, left third finger, and toenails with potassium hydroxide (KOH) prep made from scrapings taken of left thumbnail. Subungal debris was positive for hyphae and patient had yellowing, subungal debris, onycholysis of several fingernails and toenails as well as pitting and oil spots affecting most fingernails, which was clinically consistent with onychomycosis, in addition to suspected underlying nail psoriasis. He was treated with terbinafine 250mg daily by mouth for 12 weeks along with topical terbinafine for four weeks. After completion of this treatment, the patient's toenails and the left index fingernail completely cleared other than pitting and oil spots which remained on all fingernails, while the left third fingernail and bilateral thumbnails persisted with crumbling, yellowing, subungal debris, and loss of proximal nailfold. Clinically, this was consistent with nail psoriasis status-post resolved concomitant onychomycosis. He was then started on topical clobetasol ointment twice daily to the three psoriatic nails Mondays through Fridays, along with intralesional Kenalog 10mg/cc 0.2cc per proximal nailfold (or more specifically 0.1cc to the ulnar and radial aspect of each proximal nailfold) every 4 to 6 weeks with excellent result within the first two months of treatment. Although he reported pain from the intralesional Kenalog treatments, the patient found that they worked better than the topical steroid alone, and so he continued to schedule injections every 4 to 6 weeks or longer depending on duration of clinical improvement. The patient was also continued with topical terbinafine cream to fingers daily as prophylaxis against recurrence of fungal superinfection, due to his gardening hobby which caused his hands to be exposed to soil and wet environments often.

Since his last visit 10 months prior, the patient had continued to use the clobetasol ointment twice daily on his affected nails Mondays through Fridays, the terbinafine cream to fingernails once daily, and for the plaque psoriasis the triamcinolone 0.1% ointment twice daily when needed; however, his nail psoriasis had gotten much worse in the

past three months, now affecting seven fingernails, while his plaque psoriasis had also worsened. The patient was right hand-dominant, and the nail psoriasis was worse on his right hand, with the most severely affected nails being the thumbnails, making fine detail work with hands very difficult. He was no longer able to easily tie his shoelaces, button his shirts, use a zipper, or pick up a coin with his fingers. It had also made it embarrassing for him to be out in public due to the reactions he received when people would see his hands; he had taken to avoiding his favorite activities such as attending church with his wife. He denied sausage-like swelling (dactylitis) of his fingers or toes, unusual heel or plantar pain or swelling (enthesitis), or morning stiffness or pain of joints lasting more than 30 minutes. The patient requested Kenalog injections to all seven of the affected fingernails despite the discomfort of the procedure, along with anything else that might help.

PHYSICAL EXAMINATION

Upon physical exam, the patient had a total of seven fingernails and two toenails with varying degrees of onycholysis, onychodystrophy (mild to severe), areas of yellow discoloration, crumbling, red dots at the lunula, several nails with small areas of hemorrhage splinters at distal third of the nail, subungal debris, pitting, and oil spots, consistent with both nail matrix and nail bed psoriasis *(Table 1)*. He also had several fingers (bilateral thumbnails and right fourth fingernail) with mild to moderate psoriatic paronychia (edematous lateral nailfolds with overlying erythematous thin scaly plaques) and loss of the proximal nailfold (left thumbnail). See *Figures 1-3*. The patient reported mild to moderate tenderness to palpation at fingertips and periungal areas of affected nails, with exception of the two affected toenails, which were milder in comparison to the fingernails. His back, abdomen, buttocks, thighs, knees, and elbows were with erythematous silvery-scaled papules and plaques; the thickest plaques being at extensor elbows and knees (~15% TBSA plaque psoriasis). He did not have appreciable dactylitis, and the Achilles insertion sites were without swelling, redness, or tenderness. His face, scalp, genitalia,

Table 1. Clinical Presentations of Moderate to Severe Nail Psoriasis

Nail Matrix Features	• Pitting • Leukonychia • Crumbling • Red spots of the lunula • Transverse grooves (Beau's lines)
Periungal Area Features	• Chronic psoriatic paronychia
Nail Bed Features	• Subungal hyperkeratosis • Onycholysis • Splinter hemorrhages • Oil spot discoloration

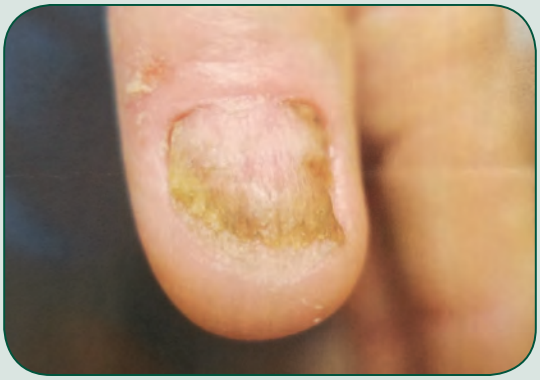

Figure 1. Image of the patient's left thumbnail at presentation (October 2020) showing brownish-yellow discoloration, crumbling, subungal debris, loss of proximal nailfold, and mild psoriatic paronychia at lateral nailfolds.

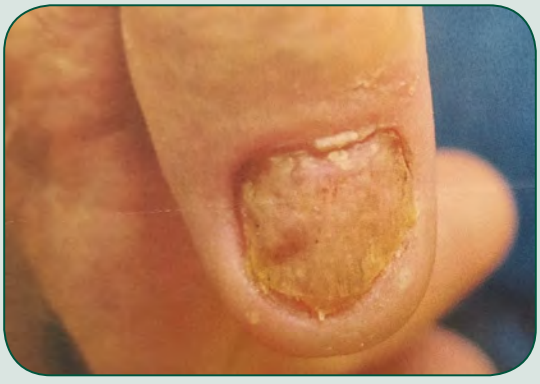

Figure 2. Image of the patient's right thumbnail at presentation (October 2020) showing brownish-yellow discoloration, crumbling, onycholysis, splinter hemorrhages, mild psoriatic paronychia at radial lateral nailfold.

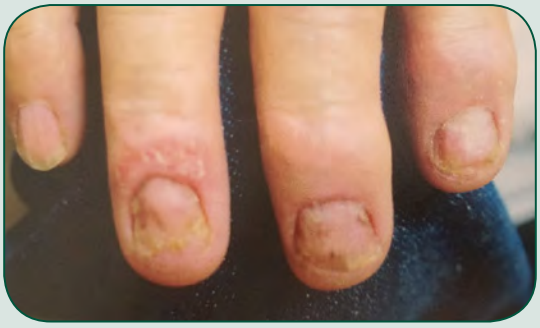

Figure 3. Image of patient's right second to fourth fingernails at presentation (October 2020) showing yellowing, crumbling, dystrophy of nailbed; psoriatic paronychia affecting fourth fingernail.

axillae, inguinal creases, palms, soles, interdigital spaces, and mucosal surfaces were spared.

At the patient's request, we proceeded with intralesional Kenalog injections to the four worst fingernails (10mg Kenalog/cc, 0.2cc per proximal nailfold). Systemic options were discussed with the patient, and in anticipation of starting a systemic treatment, labs were ordered. Options discussed included methotrexate, acitretin, apremilast, tumor necrosis factor (TNF) inhibitors or interleukin (IL) inhibitors. The patient's medical history was significant for newly diagnosed hypertrophic cardiomyopathy (HCM) with associated congestive heart failure (CHF) class II-III. He had no personal or family history of inflammatory bowel disease (IBD), and denied IBD-like symptoms, or history of gastritis or gastroesophageal reflux disorder (GERD). He admitted to having a depressed mood due to his nail psoriasis and the recent news that his wife had advanced colon cancer but denied suicidal ideation and denied history of significant depression or suicide attempt. He denied a history of known exposure to tuberculosis (TB), human immunodeficiency virus (HIV), intravenous (IV) drug use or an increased risk for hepatitis B or C exposure. The patient denied alcohol, tobacco, or illicit substance use; he also denied a history of liver or kidney disease. His complete blood count (CBC), comprehensive metabolic panel (CMP), and fasting lipid panel (FLP) including triglycerides were normal. Screens for HIV, hepatitis B, hepatitis C, and TB (T.SPOT.TB) returned negative. The patient lived 45 minutes away from the clinic and preferred less frequent visits for labs and follow up visits, though he was willing to get the Kenalog injections.

SELECTING THE RIGHT TREATMENT PLAN

With the patient's nail psoriasis worsening, affecting greater than three nails, along with his plaque psoriasis now affecting more than 10% TBSA, starting a systemic was ideal. The patient did not drink alcohol, have liver disease or a history of hypertriglyceridemia. Since methotrexate and acitretin require frequent lab visits, these were not favored as first-line treatments per the patient's preference. Apremilast was potentially a good choice for him as it would not require frequent labs, but with his current depressed mood, extra care would have been needed to monitor for worsening depression. Laser and phototherapy for nail psoriasis were not available treatments offered by the author's dermatology office.

With his new history of class III heart failure, TNF inhibitors were decided against. As the patient did not have a personal history of IBD, an interleukin inhibitor was an option. IL inhibitors for treatment of nail psoriasis were further supported by recent research. In 2020, Wasel et al[3] reported post-hoc data from a head-to-head trial of ixekizumab and ustekinumab (IXORA-S; ClinicalTrials.gov Identifier: NCT02561806), which examined the efficacy in nail psoriasis in patients with moderate-to-severe plaque psoriasis over 52 weeks. Although progressive improvement occurred with both treatments, ixekizumab showed earlier improvement compared with ustekinumab, and the improvement continued through 52 weeks regardless of baseline nail severity.[3] Based on the patient's medical history, his preferences, and findings of the IXORA-S study, we proceeded with ixekizumab.

Before initiation of treatment, we collaborated with the patient's primary care provider (PCP) on his immunization status to ensure that his immunizations, especially any live or live attenuated virus vaccines such as zoster vaccine live, were up to date. While the patient's PCP coordinated the immunizations required, we opted to add calcipotriol cream twice daily on Saturdays and Sundays to see if treatment would benefit the nail bed element of his nail psoriasis while continuing the clobetasol ointment 0.05% Monday through Friday. See *Table 2*. The patient did not feel comfortable administering his own injections due to concern he would not be able to handle the injector apparatus correctly with his current loss of ability to perform fine detail work with his hands, and so he opted to come into the clinic to have our staff give his ixekizumab injections (Week 0, then every 2 weeks for first 3 months).[4] By the time of his third injection (4 weeks into ixekizumab treatment), the patient was very surprised and pleased to report he had no pain around the affected fingernails, the redness and scaling at the proximal nailfolds had improved, and his plaque psoriasis had already improved markedly. The plaques on his trunk, buttocks, and extremities faded to pink patches, while the thickest plaques on extensor elbows and knees had thinned. Given results from the IXORA-S study, we did not expect the nails themselves to improve considerably until the 4 to 6-month mark, but the pain and inflammation at the nails had improved quickly, leaving our patient relieved and encouraged with his rapid progress.

Table 2. Most efficacious topicals targeted to treat nail matrix versus nail bed features

Nail Matrix Features *(pitting, leukonychia, crumbling, red spots of lunula, Beau's Lines)*	Topical steroids, intralesional steroids
Nail Bed Features *(subungal hyperkeratosis, onycholysis, splinter hemorrhages, oil spots, onycholysis)*	Calcipotriol

CONCLUSION

Signs of nail psoriasis, particularly crumbling, onycholysis, and discoloration, are not exclusive to psoriasis and can be observed in other common nail conditions such as onychomycosis. As there is so much similarity between some forms of nail psoriasis and tinea

unguium, it is prudent to check a fungal culture or KOH prep before initially proceeding with topical or injectable steroids. Nail psoriasis can also present as chronic psoriatic paronychia, which can develop secondary bacterial infection; therefore, it is important to treat any bacterial infection if present before proceeding with topical or injectable steroids. Severe nail psoriasis is closely associated with development of psoriatic arthritis,[2] making vigilance with screening questions regarding inflammatory arthritic symptoms, especially dactylitis and heel enthesitis, important. Collaborating with the patient's primary care team on immunizations, management of depression and other chronic health conditions, and sharing of health history is key. In this case, knowledge of the patient's newly diagnosed class III heart failure was critical information that impacted treatment decisions. By balancing the patient's preferences, other health conditions, and the clinician's knowledge of available treatment modalities along with the most recent supporting research, the patient and clinician were able to find a safe and effective treatment plan.

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Pamela Korzeniowski, PA-C, is a dermatology physician assistant with North Texas VA Dermatology and practices in Dallas and Fort Worth, Texas. She is a graduate of the University of Washington MEDEX Northwest PA program in Seattle, WA, and a current DMSc student at A. T. Still University. She is a founding member of the North Texas VA PA Committee which champions PA issues within the North Texas VA system and has served as the committee secretary since 2017. She enjoys bringing PAs together through teamwork on PA-led projects, and most of all spending time with her children and husband.

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Address for correspondence: *pbaxterj@gmail.com*

JDPA Grand Rounds

Exploration into chronic wounds on the left lower leg yields unlikely diagnosis

By Cynthia Faires Griffith, MPAS, PA-C, and Loderick A. Matthews, BS

ABSTRACT

An 82-year-old man presented with a three-year history of wounds on the left lower leg and appearance of new blisters on the same leg. This case highlights clinical manifestations, causes, diagnostic work-up, and treatment for this condition.

CLINICAL VIGNETTE

An 82-year-old man was referred to dermatology outpatient clinic for nonhealing wounds on the lower legs. The patient had a medical history of chronic kidney disease stage 3, hypertension, gout, type 2 diabetes mellitus (T2DM), depression, and vitamin D deficiency. He also had a history of skin shearing trauma as a result of repeated falls on the left lower leg for the past three years. He has had home health/wound care for the past three years, treating wounds on his lower legs with Xeroform® and Hydrofera Blue® dressings. He also regularly wrapped compression bandages on the lower legs as part of the wound care routine but, two weeks prior to presentation at dermatology, "took a break" from using the compression bandages. Since making this change in his routine, he noticed the appearance of new blisters filled with clear fluid located under the skin on the left lower leg and left tibial tuberosity, which were all areas of previous trauma. He reported no history of blisters on the feet, right leg, arms, or scalp. The patient denied experiencing itching, malodorous drainage, or pain and did not have a history of similar blistering.

The patient's list of current medications included dulaglutide, hydralazine, insulin, levothyroxine, and losartan. Physical examination revealed erosions on the left tibial tuberosity with some erosions on an erythematous base. Of note, these erosions did not appear undermined. *Figure 1* shows the patient's left lower leg and left tibial tuberosity with chronic erosions and ulcers with granulation tissue. Unrelated to the leg erosions, the patient had an abrasion on the right vertex of the scalp and left arm from involvement in a car accident four days before his appointment.

GRAND ROUNDS QUIZ

1. ***What is the most likely diagnosis for the cutaneous lesions described?***
   - A. Traumatic bullae
   - B. Bullous pemphigoid
   - C. Stasis dermatitis with bullae
   - D. Epidermolysis bullosa acquisita

2. ***What is the cause of this skin condition?***
   - A. autoantibodies against a component of the basement membrane of skin, specifically hemidesmosomes
   - B. venous valve insufficiency and venous hypertension
   - C. autoantibodies directed against type VII collagen
   - D. recent repetitive mechanical stressors or recent, new or intense frictional trauma

3. ***What are the other findings associated with this diagnosis?***
   - A. Pruritus
   - B. Fevers
   - C. Lower leg edema
   - D. No other findings associated with this diagnosis

DIAGNOSIS

A punch biopsy for histopathology was taken from the edge of the erosion on the left leg. *(Figure 2)*. A shave biopsy for histopathology was performed to remove a 4x5 mm bulla on an erythematous base; the entire bulla was shave biopsied *(Figure 3)*. Normal appearing skin within 1 cm of the bulla was punch biopsied for direct immunofluorescence.

The patient's serum (blood) was taken for indirect immunofluorescence for autoantibodies against skin and enzyme-linked immunosorbent assays (ELISA). The histopathology from the punch biopsy of the erosion and the shave biopsy of the bulla showed a sub-epidermal vesicle with an inflammatory infiltrate of eosinophils, neutrophils, and lymphocytes. Type IV collagen was on the floor of the blister.

The perilesional skin punch biopsied for direct

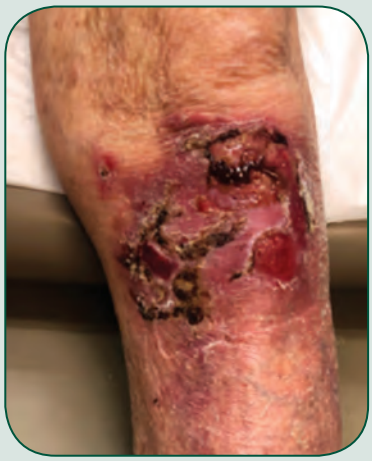

Figure 1.
Left leg with localized erosions, eschar, granulation tissue, and erythema

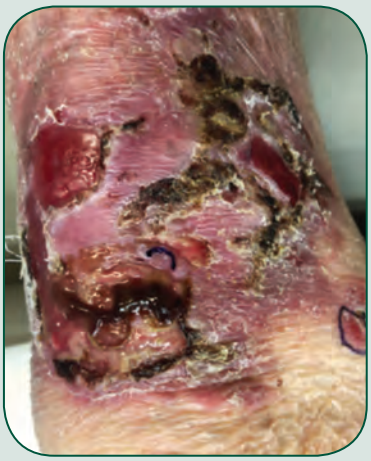

Figure 2.
Left leg with erosions, eschar, and erythema. The circled site at the edge of an erosion was punch biopsied for histopathology.

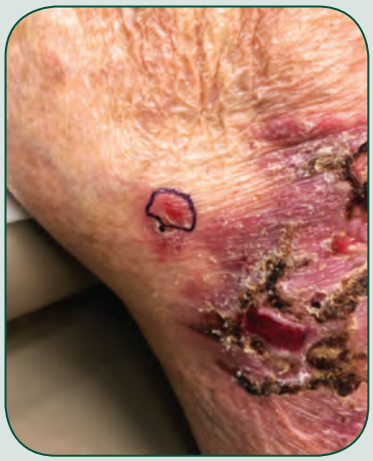

Figure 3.
Circled biopsy site on the left lateral leg denotes the site of shave biopsy of an intact bulla for histopathology.

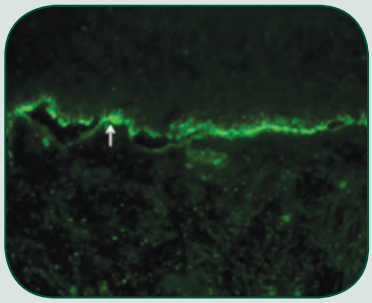

Figure 4.
Direct Immunofluorescence of 1 M NaCl split patient skin showing IgG localized to the epidermal side of the split.

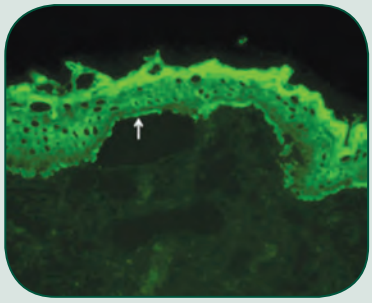

Figure 5.
Indirect Immunofluorescence of 1 M NaCl split foreskin showing IgG localized to the epidermal side of the split at a titer of ≥40.

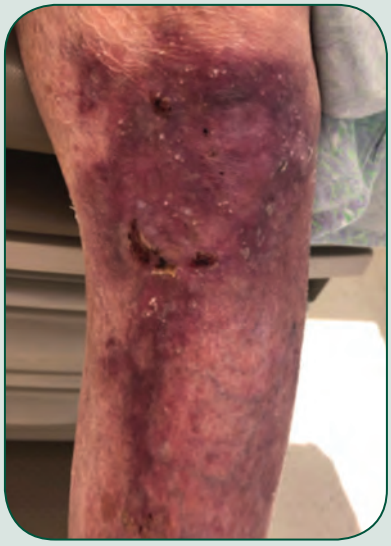

Figure 6.
Patient's leg after three weeks of topical steroid treatment, note the milia.

immunofluorescence revealed Immunoglobulin G (IgG), third component of complement (C3), and fibrin in the epidermal basement membrane *(Figure 4)*. The patient's serum tested for indirect immunofluorescence was positive for autoantibodies against the epidermal side of 1 M NaCl split skin at a titer of ≥40 *(Figure 5)*.

The patient's serum was then tested for IgG autoantibodies against baculovirus-derived BP180 and BP230 by ELISA. The patient was negative for IgG autoantibodies against both BP180 and BP230.

The patient's clinical picture and biopsy and direct and indirect immunofluorescence are compatible with the diagnosis of bullous pemphigoid (BP).

DISCUSSION

BP is an acquired autoimmune blistering disease. In this condition, autoantibodies against skin, specifically against BP180 and/or BP230 within the hemidesmosomes. Hemidesmosomes hold basal keratinocyte cells to the dermis. As a result, tense blisters form as the epidermal skin cells separate from the dermis. Prior to development of the blisters, itching can be present. In some patients, itching and urticaria can

be the prodrome before the blisters; in other patients, pruritus can be the only presenting symptom with blisters never developing.

BP typically presents in patients after age 60, but it can appear earlier in life. It can be localized to one body surface area, typically the lower legs/feet, or generalized. Typical locations for BP are trunk and extremities. There is also a subset of patients whose mucous membranes are affected, and this is classified as mucous membrane pemphigoid.

Painful erosions on the mucosa are present in 10 to 30 percent of patients.[1] The oral mucosa is the most frequent location of mucosal involvement; less frequently, BP involves other mucosal sites, such as the larynx, genitals, and anus.

BP can also be induced or triggered by a variety of medications, including nonsteroidal anti-inflammatory drugs (NSAIDS); diuretics like furosemide, antihypertension medications including betablockers, ace inhibitors, calcium channel blockers, and antibiotics like rifampicin, penicillin, and quinolones.[2] Drug-induced BP tends to affect younger patients. The eruption can appear up to three months after ingestion of the culprit medications.[3] Another medication class more recently associated with drug-induced BP are dipeptidyl peptidase 4 inhibitors (DPP-4 inhibitors or gliptins).[4] The patient described in this case was on sitagliptin from 2009 to July 2019. The patient reported that the bullae developed starting April 2020, nine months after he stopped taking sitagliptin. Infections, UV light, or trauma can also cause of flare of BP or induce onset of new blisters.

Diagnostic Testing. Biopsy for histopathology should be taken from an intact bulla (using shave or punch technique) or punch biopsy from the edge of an erosion. Place these tissues samples in formalin. The pathologist will be looking to see the level of the skin that is separating to cause the blister formation; in the case of BP, this will be a subepidermal blister. Histology also elucidates the cell types present in the skin including lymphocytes, neutrophils, and eosinophils.[5]

A biopsy of perilesional skin, meaning normal appearing skin that is within 1 cm of the blister, can be sampled with punch biopsy and placed in Michel's media for direct immunofluorescence testing. This testing looks for autoantibodies and other immunoreactants in skin to identify the type and where they are deposited within the skin. The patient's skin is cross sectioned and examined for *in situ* deposits of IgG, IgA, IgM, C3, and fibrinogen. Deposits of IgG or C3 in the basement membrane zone, or more specifically on the epidermal side of the blister, supports the diagnoses of bullous pemphigoid *(Figure 4)*. Other blistering disease can present with different deposits in different locations. For example, IgA in the dermal papillae is characteristic of dermatitis herpetiformis.

Further tests that can be done to gain additional evidence for a diagnosis of BP is indirect immunofluorescence testing (IDIF) and ELISA. IDIF can be used to see if the patient's blood carries autoantibodies, specifically IgG, that localizes to the epidermal side of 1 M NaCl split skin, which could suggest that the IgG autoantibodies are binding to the hemidesmosomes (180 and 230) and causing the blistering. In IDIF, the patient's serum is incubated on a substrate; for suspected BP, the substrate is salt split skin, washed extensively and then rabbit anti human IgG with a fluorescent marker is incubated on the skin and the bound patient's autoantibodies, if present. The rabbit anti human IgG binds to the patient's IgG and marks it with a florescent tag. Then the specimen is examined using fluorescent microscopy to see if there is deposition of the patient's IgG from their blood onto the skin substrate and, if so, where the deposition is (e.g., epidermal or dermal side of the salt split skin). Linear deposition of IgG along the epidermal side of salt split basement membrane supports the diagnosis of BP. *Figure 5* shows this linear deposition in our patient. In IDIF, the substrate for BP is salt split skin, but there are multiple substrates that can be used for different disease processes. For example, when testing for pemphigus vulgaris, the substrate typically used for IDIF is monkey esophagus because 1 M NaCl split skin is a poor substrate to probe with autoantibodies from patient sera because the desmogleins, the antigen associated with pemphigus targeted by the autoantibodies that mediate this autoimmune disease process, are buried between the keratinocytes of normal human skin.

To further illuminate the target of the binding of the patient's autoantibodies, the serum is tested by ELISA. In ELISA, the patient's serum is diluted in a buffer, incubated in a well of a plate that is coated with the antigen of interest, BP180 or BP230 in this case, washed extensively and an enzyme conjugated anti-human IgG antibody is applied and incubated. After further washing, the enzyme substrate is added to the plate and if the patient's autoantibodies have bound the antigen, a color change is observed. This color change is read by a plate reader that measures the absorbance of transmitted light and produces a readout that can be quantified against the standards provided by the kit manufacturer. This patient was negative by ELISAs for BP180 and BP230 autoantibodies. However, this result could be due to the proteins used in this specific assay are bacculovirus derived and may not present the antigenic determinate that is targeted by the patient's autoreactive IgG. Further, the diagnosis of BP is based on the entire clinical picture, not just a single negative test.

Treatment Considerations. If the disease is localized to an area as it was in this patient, topical treatment is the treatment of choice. High-potency topical steroids like clobetasol would be a good option.

For mucous membrane involvement, high-potency topical steroid can also be used in the mouth, typically the ointment or gel is better tolerated for oral lesions.

If the patient has extensive disease covering more body surface area, other treatments like antibiotics specifically doxycycline in combination with nicotinamide can be utilized to slow the formation of additional bullae. Oral steroids are a mainstay of therapy if topical therapy is not feasible given body surface involvement; however, this can be detrimental to patient's bone and cardiovascular health when used long term so steroid-sparing agents like azathioprine, mycophenolate, or rituximab are also used in refractory BP to arrest development of bullae.

CLINICAL VIGNETTE CONTINUED

This patient was prescribed topical clobetasol to use on the left knee. He used this not on the open skin but on intact skin. As he had traumatic skin erosions from falls, the knee was covered with wound dressing with Vaseline then nonstick pad and then coban wrap. Care was taken to not shear off the tops of the blisters that developed with his dressing changes. The bullae healed with a little milia formation within three weeks of this treatment *(Figure 6)*. Since then, the patient was started on doxycycline and nicotinamide. He did not develop any new bullae. He did not tolerate the doxycycline due to gastrointestinal upset, so this was held. He continues to have no new bullae.

KEYWORDS

Dermatology grand rounds, case report, bullous pemphigoid, itching, urticaria, blistering, wound care

JDPA Grand Rounds Quiz Answer Key:
Answers: 1) B, 2) A, 3) A

CLINICAL ASIDE

- BP can present in sites of trauma. This patient had a history of shearing trauma to the skin and this could have been the inciting factor in his development of BP localized to the site of past trauma.
- This patient had a history of taking a DDP-4 inhibitor, sitagliptin, for his diabetes management. This medication can cause drug-induced BP. However, the patient's bullae started nine months after stopping the medication, making this unlikely as the cause of his BP.
- In some patients, itching and urticaria can be the prodrome before the blisters or they can be the only presenting symptom with blisters never developing. For that reason, BP should be on the differential for itching and/or urticaria, especially before treating pruritus or urticaria with phototherapy as UV exposure can worsen BP and induce new onset of bullae if a patient is in the urticarial phase.

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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.*

Loderick A. Matthews, BS, *is a research associate in the Cutaneous Immunopathology Laboratory in the Department of Dermatology at the University of Texas Southwestern Medical Center in Dallas, Texas. Loderick frequently contributes fluorescent microscopy photographs to case studies presented by residents and faculty at the Department of Dermatology Grand Rounds. When Loderick is not in the lab, he is a runner, cyclist, and a working musician.*

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Address for correspondence: *Cynthia Faires Griffith, MPAS, PA-C; fairesc@gmail.com*

Increasing Dermatology Access Via Teledermatology

By Jason E. Quicho, DMSc, PA-C

ABSTRACT

Purpose: The purpose of this article is to identify if teledermatology is a viable approach compared to traditional in-office dermatology visits for effective and increased access to dermatologic care in underserved populations and within resource limited hospitals. **Method:** A literature search was conducted with search terms "teledermatology," "underserved," "dermatology," and "hospital." Seventeen pertinent articles were retrieved that serve as the basis for this review. **Results:** While recent literature has shown teledermatology may increase access to dermatology providers and improve treatment of cutaneous diseases in under-resourced health centers, further studies are needed to explore the benefits and challenges when implementing teledermatology in wider practice settings. **Conclusion:** Dermatological issues are common chief complaints many primary care providers encounter. While some issues are benign, others require referral to dermatology providers to rule out worrisome pathologies. Given the shortage of dermatology providers in the United States, many patients in underserved populations and resource-limited hospitals often wait weeks or months to be seen. Use of teledermatology combats the shortage of dermatology providers by providing access to patients who are unable to receive dermatological care in a timely, efficient, and cost-effective manner.

KEYWORDS

Teledermatology, underserved, hospital, dermatology, rural, telemedicine, technology

INTRODUCTION

Access to dermatology providers in underserved populations and hospitals with limited resources is in high demand.[1] Many patients have urgent dermatological needs that may have not been addressed by their primary care providers (PCPs). Further, numerous complex cutaneous pathologies often present in patients who lack medical resources as well as those in hospitals with limited resources. Since patients often face multiple barriers in accessing dermatology providers, patients often wait weeks or months to be seen.[1] Due to the shortage of dermatology providers in the United States, different approaches to healthcare delivery must be considered in order to provide efficient and increased access to care within these patient populations.

With the advent of new technological capabilities and breakthroughs in medicine, patients now have increased options to provider access. An example of new technological access is through teledermatology. Teledermatology is a subspecialized field within dermatology that aims to provide increased access to patients through digital platforms via audio, visual, and data communication.[2] Since teledermatology is a recent subspecialty within dermatology, further research is needed to determine if teledermatology provides effective and increased patient access compared to traditional in-office dermatology.

DISCUSSION

Establishment of Telemedicine. Telemedicine began around the 1950s starting with hospitals sharing images along with information via telephone. Overtime, it slowly developed from sending radiographic images to connecting physicians with patients and specialists remotely.[3] With the establishment of telemedicine, a larger geographical reach, especially for individuals in rural regions without access to specialist care, was quickly realized. Further advances through other technological means, such as portable computers and smart phones, improved access, paving the way for modern telemedicine. The ability to transmit high-quality videos and audio in real-time resulted in cost-effective measures and enabled care for patients who were unable to visit specialists otherwise. While many medical specialties recently incorporated telemedicine within their practice, dermatology has been utilizing telemedicine for quite some time.

Beginnings of Teledermatology. Teledermatology has increased in utilization during the last few years. Given the demand of dermatological care and shortage of dermatology providers, teledermatology has allowed for increased and timely access to patients who need

dermatological care. One of the greatest benefits of teledermatology is the increased access to care in rural and remote settings. One of the more common uses in teledermatology is in skin cancer screenings, diagnosis, and treatment management. This has been an active area within teledermatology and numerous studies in the literature have shown a reported accuracy in diagnosis rates of around 80 percent.[4] Dermatologists performing teledermatology were able to correctly diagnose 36 of 38 (95%) cases with an average confidence level of 7.9 of 10.5. The average time to consultation was 0.8 days with patients reporting high levels of satisfaction.[5] Teledermatology has greatly increased access to dermatological care and continues to refine its processes to better streamline services while providing cost-effective care.

Access to Dermatology Providers. Dermatology access is provided through teledermatology and in-office dermatology settings. Unfortunately, there is a shortage of dermatology providers in the United States, especially in resource-limited settings (RLS). RLS are classified by limited access to providers; few healthcare professionals; less developed infrastructure; and reduced availability of medications, supplies, and equipment. Dermatologists in RLS are fewer in number and generally work in urban areas, rarely traveling to rural communities.[6] Patients who live in rural areas often lack access to seeing specialists due to cost of transportation and services. Further, healthcare professionals in rural areas may lack sufficient dermatology training. This limits effective dermatological care for patients who do not have access to dermatology specialists.

Access Via Teledermatology. Teledermatology is a cost-effective way to deliver dermatological care to underserved areas.[7] Further, teledermatology reduces in-person visits allowing for patient convenience and quicker delivery of care. There are currently two main modalities in use for teledermatology—"store-and-forward" and "live interaction." Store-and-forward handles digital pictures uploaded by a referring provider while live interaction typically involves a video interaction with a provider and a dermatology provider. Teledermatology increases patient care while decreasing the access gap by mitigating patients' cost and time concerns. Importantly, teledermatology can be implemented in rural or resource-limited hospitals where providers are familiar with endemic diseases and local healthcare delivery.[6] A telephone survey of 148 patients who were randomly selected out of 1,030 patients who had been seen by store-and-forward teledermatology sought to measure patient satisfaction with teledermatology providers and services. When asked how satisfied responders were with their teledermatology providers, 87 percent rated their providers as excellent or good and 83 percent rated the explanation, they received about the teledermatology service as excellent or good.

In-office Dermatology. In many PCP practices, skin diseases are present in 30% of all office visits. Chronic skin diseases lead to decreased quality of life and financial consequences. In the U.S., patients living in remote and underserved areas have difficultly accessing dermatology providers for initial and follow up care.[8] As the U.S. population and average life expectancy continues to increase, there exists a need for dermatology providers. With the increased incidence of skin cancers and complex skin disorders, there is a high demand for dermatological providers.[9] In 2014, dermatology mean appointment wait times were 18 days for established patients and 29 days for new patients. Wait times for new and established patients in rural areas were longer than those in urban areas. Further, travel time for rural patients seeking dermatology care were longer than those residing in urban and metropolitan areas.

BILLING AND PRIVACY CONCERNS

Teledermatology allows for quicker access to providers and plays a large role in delivering dermatological care. One of the greatest strengths of teledermatology is its role in triaging by reducing the number of unnecessary referrals resulting in decreased wait times for patients.[10] While teledermatology allows for increased access to patients, concerns such as billing, insurance and privacy issues must be accounted for in order better understand the benefits within this subspecialty of dermatology.

Billing and Insurance. Teledermatology provides benefits to the healthcare provider and patient by improving access to care. While few studies found teledermatology to be more expensive than conventional care, most studies show teledermatology as equivalent or more economical than face-to-face visits. The economic benefits for healthcare systems resulted in fewer face-to-face specialist referrals, reduced travel time, reduced costs, and decreased time away from work for patients leading to quicker assessments and treatments.[11] Real-time video consultation in teledermatology tends to be more expensive than store-and-forward modalities but can be cost effective, particularly if patients live far from dermatological specialists. Further, reimbursement can be an issue when integrating teledermatology into healthcare systems. Teledermatology reimbursement depends on the modality used (store-and-forward versus real-time versus hybrid), consultation costs, follow-up, and referral processes. If implemented within the appropriate setting, teledermatology can increase quality of care while decreasing costs.[12]

Privacy. Patient privacy must be considered when establishing new modalities of healthcare delivery. Privacy can be achieved by requiring secured login details and consent before information is delivered between healthcare provider and patient. The Health Insurance Portability and Accountability Act of 1996 (HIPAA) protects patients' medical records and health information. To successfully implement teledermatology, appropriate navigation of HIPAA is crucial.[13] There are many systems in place ensuring the protection of patient privacy. These include electronic billing to minimize fraud and devices that protect the security of information by utilizing passwords preventing unauthorized individuals from accessing patient information. Overall, teledermatology is safe and secure but can always be further improved upon to ensure patient privacy and protection.

OUTLOOK OF TELEDERMATOLOGY

Teledermatology has successfully increased access to dermatology care for many patients. Teledermatology has proven to be accurate in diagnosis, management, and clinical outcomes when compared to in-office visits. It has decreased many barriers patients faced prior to initiation of teledermatology.[14] Teledermatology can be applied to many medical settings such as hospitals, outpatient clinics, nursing homes, and in underserved and remote settings to deliver care. Further, teledermatology has decreased patient wait times for patients seeking care for their cutaneous concerns.

Impact on Rural and Underserved Populations. Many underserved areas receive minimal to little exposure to dermatological specialists. It is important to note that cutaneous conditions may be the initial manifestation of more worrisome medical diagnosis, cancer syndromes, and other conditions.[15] Given the shortage of dermatology providers in the U.S., finding access in rural or underserved hospitals continues to be a challenge. Fortunately, the advent of teledermatology resulted in community outreach and improved access to dermatologic care. Using photographs, PCPs are able to send digital images to remote dermatologists who then evaluate the cutaneous concerns without being physically present. Uninsured patients, those living in rural areas, and those who seek care in underserved or safety net hospitals tend to have decreased access to dermatologists. Teledermatology has reduced barriers to care among disadvantaged populations.

Future Implications of Teledermatology. Teledermatology helps fill a crucial void given the shortage of dermatology providers. This is shown in the effective deliverance and efficacy of teledermatological care provided in rural and underserved communities that often lack specialists. Newer and more sophisticated technologies such as smart phones and virtual phone apps have further increased access to dermatology providers. For example, mobile teledermatology (such as smart phones), are a cost effective and triaging tool useful for PCPs in underserved and remote areas and has effectively reduced wait times for patients seeking dermatology care.[16] With quickly developing technological advancements and demand for dermatology services, teledermatology has paved the way for efficient and cost-effective care.

CONCLUSION

Dermatology access and care is in demand. Due to limited and difficult access especially in rural and underserved patient populations, new and novel approaches are needed for patients seeking consultation for dermatology services.[17] In recent years, there have been discussions of telemedicine, in particular in dermatology, to meet the growing needs of patients seeking dermatological care. Teledermatology involves delivering dermatological care via communication technology such as live interactive and store-and-forward. Some organizations utilize a hybrid model where images are used in combination with videoconferencing.[2] Others incorporate mobile teledermatology such as smart phones to better deliver and increase access to dermatology care.[16] Technological access via teledermatology helps decrease the need to be seen in person for certain dermatological concerns, especially for patients in rural or safety net hospitals where care by specialists is often difficult to obtain. By utilizing teledermatology, increased access and decreased wait times will provide patients with quicker appointments for their dermatological conditions and concerns.

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Jason E. Quicho, DMSc, PA-C, *graduated from Samuel Merritt University's Physician Assistant program in 2015 and completed his Doctor of Medical Science degree at the University of Lynchburg, Lynchburg, Virginia, in 2020. He has worked in both county and large hospital dermatology-based practices during the last three years and is currently working full time with the dermatology group at Kaiser Permanente in San Francisco, California. He is a member of the Society of Dermatology Physician Assistants (SDPA) and the American Academy of Physician Assistants (AAPA).*

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Address for correspondence: *Jason E. Quicho, DMSc, PA-C, jcho86@gmail.com*

Reflectance Confocal Microscopy: An Introduction

By Megan Dauscher, MS, PA-C, and Rachel Manci, BS

KEY WORDS

Reflectance confocal microscopy, dermoscopy, optical coherence tomography, skin cancer

ABSTRACT

Reflectance confocal microscopy (RCM) is a noninvasive, in-vivo, imaging modality used to diagnose and manage skin cancers, benign skin neoplasms, and inflammatory dermatoses. Although previously considered an academic tool, the increasing number of available RCM resources make it necessary for dermatology physician assistants to expand their knowledge base within this field.

INTRODUCTION

There have been many modern advances made in the field of dermatology, particularly in evaluating the skin lesions for malignancies. Initially, the basic morphologies of skin lesions were evaluated by the naked eye, then occasionally with the assistance of a magnifying glass. Patients and providers alike have followed guidance from the American Academy of Dermatology (AAD) and other medical organizations to look for the "ABCDEs of melanoma." This well-known mnemonic for assessing characteristics of melanoma, including Asymmetry, Border irregularity, Color variation (both intralesional color variation as well as a color that is different from the patient's other nevi), Diameter greater than 6mm, and Evolving (a new or changing lesion).[1] Dermoscopy, a noninvasive technique that involves using a hand-held light magnifier (usually 10-fold magnification) to visualize a skin lesion, allows clinicians to observe the surface and subsurface structures that are invisible to the naked eye.[2]

Although dermoscopy has been shown to increase the accuracy of diagnosing cutaneous malignancy, the challenge for clinicians to accurately recognize malignancy while simultaneously minimizing unnecessary surgical procedures, remains.[3,4] One technique that has proven successful in meeting this clinical challenge is reflectance confocal microscopy (RCM).

BASIC MECHANICS OF RCM

An understanding of the basic mechanics of RCM is essential to its application and interpretation. A diode laser is the source of coherent, monochromatic light. The emitted light beams are projected into the skin after passing through a beam splitter, a scanning and focusing optical lens, and a probe *(Figure 1)*.[5] Each light beam is projected into the skin, which causes illumination of a small point within it. Light is then reflected from this focal point back through the lens via a small pinhole onto a photodetector; the pinhole selectively allows light from the focal point to pass through, hence confocal, and inhibits light from other tissue points or planes. The generation of RCM images relies on differing reflectivity and back scattering of light from chemical and molecular structures due to their differing refractive indices. Structures with higher refractive indexes result in brighter images. For example, melanosomes and melanin have a high refractive index, resulting in white structures in a confocal image.

The 830 nm diode laser used in RCM allows for the visualization of the papillary and upper reticular dermis, depending on the anatomic location; it does not cause any tissue injury (including injury to the eye) due to this limited imaging depth. Increasing the intensity of the laser would result in deeper imaging capacity, but at the cost of increased morbidity to operator and patient.

By utilizing the VivaScan system, the user can obtain sets of images that have en-face orientation at varying depths (z), calculated as micrometers below the skin's surface. The types of imaging functionalities available through the VivaScan system include the capture of single images, blocks, stacks, cubes, and movies, all of which can be used to analyze lesions of up to 8mm x 8mm. To obtain images representative of a single depth, the user can obtain single images and blocks. A single, basic image measures 500µm x 500µm and can be viewed onscreen in real time. A block is a large mosaic of up to 256 basic images of identical depth that are sequentially stitched together to create an en-face field of view much larger than that of a single, basic image *(Figure 7)*. To optimize lesion analysis and diagnostic accuracy, mosaic images should be obtained at the suprabasal epidermis, the DEJ,

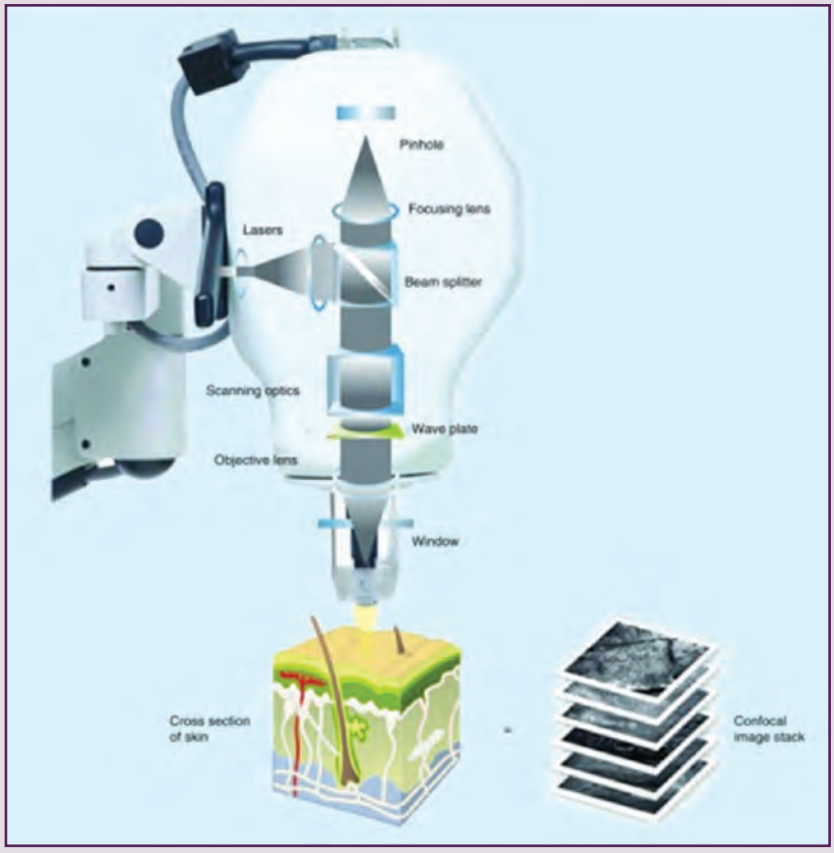

Figure 1.
Basic principles of confocal scanning microscopy.
Image reproduced courtesy of Caliber Imaging & Diagnostics, Inc.

and the papillary dermis.[6] This field of view ranges in size from 1mm x 1mm to 8mm x 8mm. Additionally, a user can obtain images that provide vertical depth information by obtaining stacks and cubes. A stack is a series of basic 500µm x 500µm en face images taken at set depth increments, commonly obtained by starting at the level of the stratum corneum and ending in the dermis *(Figure 8)*. Cubes are similar to stacks, but instead of a series of basic 500µm x 500µm images, cubes are formed when multiple blocks are obtained at set depth increments. Finally, to obtain a real-time evaluation of the native tissue, movies or short videos can be recorded in the form of AVI files up to two minutes in length for the real-time showcase of specific features such as blood flow and other vascular structures.

Two commercially available devices for RCM in the clinical setting are the VivaScope 1500 –wide probe RCM and the VivaScope 3000 – handheld RCM; both devices offering similar image resolution quality *(Figures 2 and 3)*.[6]

To utilize the VivaScope 1500 device, a drop of oil is placed on the target site, and then a polymer window must be directly adhered to the patient's skin atop the drop of oil. The VivaScope dermoscopic camera is first placed inside the polymer window, and a dermoscopic image of the lesion is generated *(Figure 4)*. After applying ultrasound jelly to the inside of the polymer window, the Vivascope 1500 imaging probe is then connected to the window, and RCM imaging can begin *(Figure 6)*. The dermoscopic image allows for targeted RCM imaging of areas of interest *(Figures 5 and 7)*. Although the VivaScope 1500's required polymer window provides for more controlled imaging of skin lesions, it does limit the utility of the device for smaller anatomic areas or areas with a large amount of contouring, such as the nose, ears, perioral, and orbital areas.

VivaScope 3000 handheld probe provides for increased operator dexterity, but at the cost of a smaller field of view (1000 x 1000 µm2) and inability to generate mosaic images; the device can only obtain movies, stacks, and single images. It is unable to correlate RCM images with the dermoscopic image.

In order to recognize abnormalities utilizing RCM, it is essential to first understand how normal skin appears. Starting with the most superficial layer, the stratum corneum appears as a very bright – highly refractive-surface surrounded by dark furrows, which represent skin folds or dermatoglyphs.[5,6] Here the operator will visualize large (10-30 µm) polygonal-shaped corneocytes that lack a visible nucleus. This layer is typically located

Figure 2.
VivaScope 1500 device overview and up-close view of scanning unit.
Image courtesy of Caliber Imaging & Diagnostics, Inc.

about 0 to 20 µm below the outermost surface of the skin *(Figure 8a)*.

Located 15-20 µm below the outermost surface of the skin, the stratum granulosum is the first layer of epidermis with retained nuclei, which appear sparse and large on confocal imaging *(Figure 8b)*. The keratinocytes in this layer have well-demarcated outlines, forming a honeycombed pattern. The keratohyalin granules and organelles give a white, grainy appearance to the cytoplasm that surrounds the round or oval shaped, dark central nuclei.[5,7]

Penetrating deeper into the epidermis, the stratum spinosum exists at depths 20-100 µm below the skin's surface. Here, the keratinocytes are smaller in comparison to those of the granular layer, measuring about 15-25 µm in diameter. These cells are also polygonal shaped, containing thin, white cytoplasm, which surrounds oval, dark nuceli forming a honeycomb pattern *(Figure 7c)*.

At an average depth of 50-100 µm below the skin's surface lays the stratum basalis: a single layer of germinative cells residing just above the dermis. These cells are smaller than spinous keratinocytes, measuring about 7-12 µm, but appear brighter due to the presence of melanin caps on top of their nuclei. Pigmented keratinocytes and melanocytes have a high refractive index due to the presence of melanin, and appear as solitary round or oval structures. These two cell types are virtually indistinguishable from one another.

Skin phototypes affect the appearance of basal keratinocytes in RCM. Due to the lack of pigment in skin phototype 1, basal keratinocytes are difficult to delineate due to their low refractive index. In phototypes II-IV, the increased melanin in keratinocytes yields a higher refractility resulting in a cobblestone pattern.

At the dermo-epidermal junction (DEJ), melanocytes and basal keratinocytes form bright rings surrounding dark colored dermal papillae, an arrangement known as "edged papilla" *(Figure 8d)*.[5] Within the dermal papillae, arterioles and blood flow can be observed with real-time RCM examination which aids in identification of the DEJ *(Figure 8d arrow)*.

The papillary dermis can be found about 100-150 µm below the surface of the skin followed by the reticular dermis which lies >150 µm below the skin's surface which contain a network of fibers and bundles. Collagen fibers appear as elongated, bright, acellular, anucleated, fibrillar structures situated side by side throughout the dermis *(Figure 8e)*. Blood vessels in this layer appear as dark tubular structures and blood flow can be observed during real-time examination *(Figure 8d arrow)*. Collagen fibers that surround these blood vessels are usually distributed as rings or coils in the papillary

Figure 3.
VivaScope 3000 handheld device, image courtesy of Caliber Imaging & Diagnostics, Inc.
Image reproduced courtesy of Caliber Imaging & Diagnostics, Inc.

Figure 4.
VivaCam imaging device.
Image reproduced courtesy of Caliber Imaging & Diagnostics, Inc.

Figure 5.
Obtaining an RCM image with VivaScope 1500.
Image reproduced courtesy of Caliber Imaging & Diagnostics, Inc.

Figure 6.
Basic equipment required for VivaScope imaging including ultrasound jelly, mineral oil, alcohol pads and the polymer adhesive window required for the 1500 device

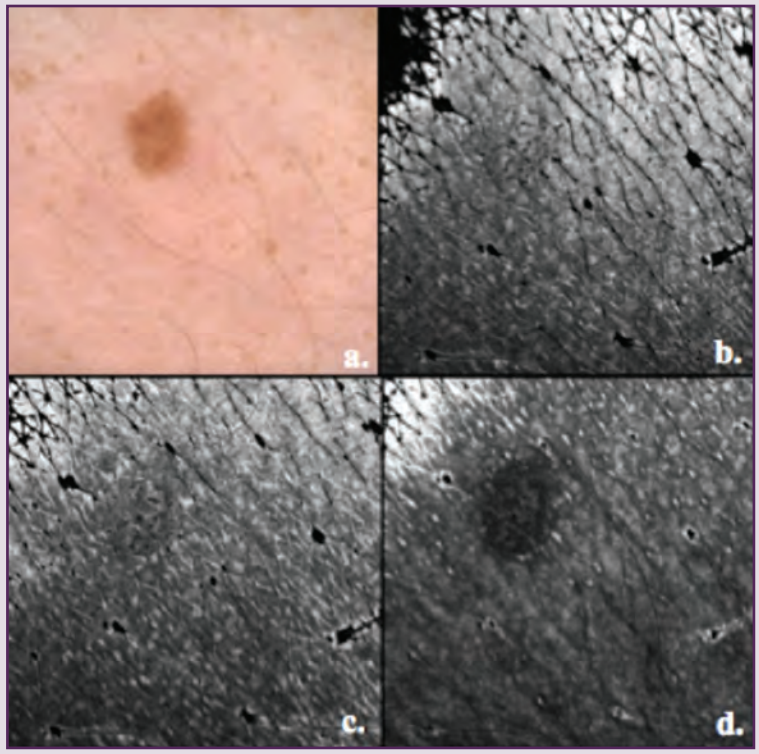

Figure 7.
*Dermoscopic overview of a nevus on the left dorsal forearm **(a.)** as well as blocks taken at varying depths (stratum granulosum **(b.)**, DEJ **(c.)** and papillary dermis **(d.)** at the same location providing the effect of a virtual biopsy.*

dermis but appear as parallel bundles gathered into large fascicles in the reticular dermis.

RCM imaging alone has been shown to significantly improve the early detection of and diagnostic accuracy of melanocytic and nonmelanocytic skin cancers when compared with dermoscopic and clinical examination alone.[6]

A 2016 meta-analysis of 21 studies and 3602 lesions showed that the combined results for sensitivity and specificity of all malignant tumors were 93.6 percent (95% CI: 0.92-0.95) and 82.7 percent (95% CI: 0.81-0.84) respectively.[8] Subgroup analysis for detection of cutaneous melanomas amongst these lesions showed a sensitivity of 92.7 percent (95% CI: 0.90-0.95) and a specificity of 78.3 percent (95% CI: 0.76-0.81). A sensitivity of 91.7 percent (95% CI: 0.87-0.95) and specificity of 91.3 percent (95% CI: 0.94-0.96) was discerned for detecting basal cell carcinoma with RCM.[8]

Regarding specific melanoma subtypes, the reported sensitivities and specificities vary, but all are still greater than those seen with dermoscopic and clinical exam alone. A 2020 meta-analysis of 7 studies and 1111 lesions demonstrated that the sensitivity and specificity of RCM for the diagnosis of amelanotic/hypomelanotic melanomas were 67 percent (95% CI: 0.51-0.81) and 89% (95% CI: 0.86-0.92), respectively.[9] Another literature review article stated that the sensitivity and specificity of RCM for the diagnosis of lentigo maligna ranges between 85 and 93 percent and 76 to 82 percent, respectively.[10]

Because RCM is a valid method of accurately diagnosing malignant skin tumors, it has been used for evaluation of equivocal lesions to determine the best course of action: biopsy, wide local excision, clinical monitoring etc.[3] The addition of RCM examination to dermoscopic evaluation and/or digital follow-up has decreased the number of biopsies performed on benign lesions.[11] Identifying known RCM features can help distinguish benign nevi from malignant melanoma lesions, thus driving down the number of biopsies on lesions eventually proven to be benign.[11] Some of the RCM features associated with melanoma include round pagetoid cells and large atypical bright cells in the epidermis, cellular atypia at the basilar layer, non-edged papillae at the DEJ, and atypical nucleated cells in the dermis.[11] In contrast, benign nevi demonstrate well conserved honeycomb and cobblestone patterns in the epidermis, and edged papillae at the DEJ.[11]

RCM is also useful for monitoring equivocal lesions at routine intervals to determine if the lesion displays any changes, similar to short term mole monitoring with dermoscopy. RCM can be utilized to determine response in lesions treated with imiquimod, photodynamic therapy, cryotherapy as well as other treatment modalities.[12]

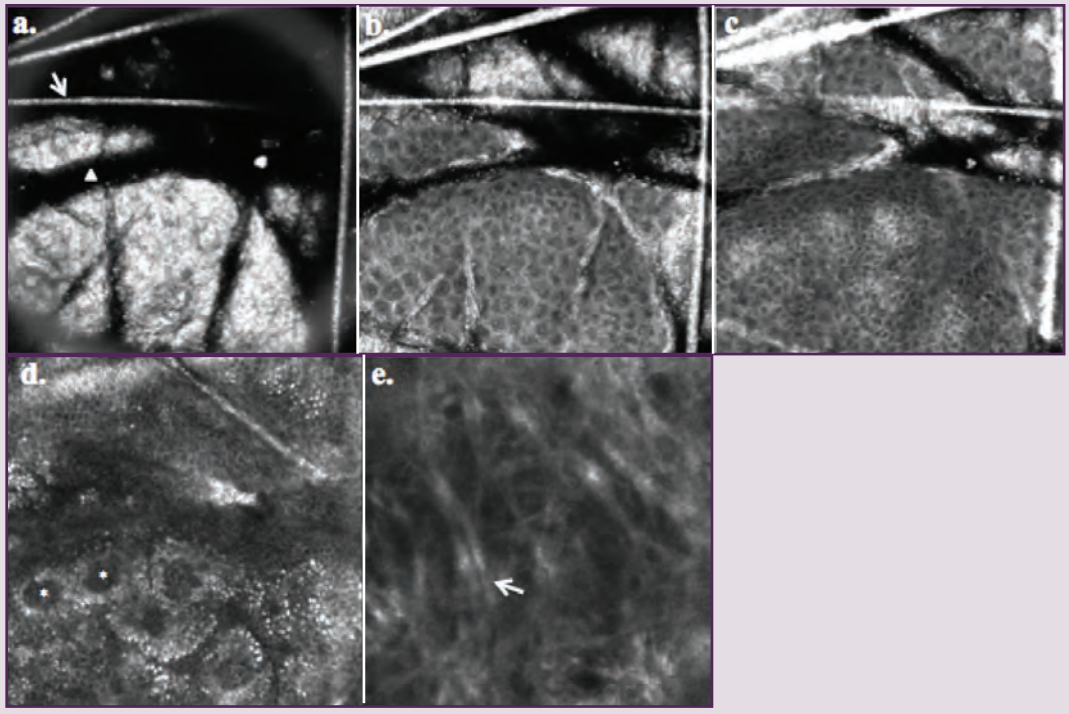

Figure 8.
RCM images and their histologic correlates of varying layers of normal skin. A. Stratum corneum displaying highly refractile keratinocytes and dark furrows representing dermatoglyphs (triangle). The cylindrical structure in the upper left-hand corner represents a hair shaft (x) B. Stratum granulosum depicting polygonal keratinocytes C. Stratum spinosum depicting a typical honeycomb pattern D. DEJ showing edged papillae (asterisk) E. Papillary dermis displaying strands of bright collagen fibers (arrow).

RCM can also be used in conjunction with laser ablation to optimize treatment by using a targeted histologic approach for fast and minimally invasive removal of nodular and superficial basal cell carcinomas.[13]

RCM may also be used in the surgical setting to optimize patient care. Handheld RCM can be used utilized in conjunction with Wood's lamp and dermoscopy to formulate a map for dermatologic surgeons to follow during staged excisions of lentigo maligna (LM) and lentingo maligna melanoma (LMM). These maps can result in improved patient counseling based on the increased accuracy of the anticipated defect size as well as sparing of healthy tissue by reducing the number of biopsies that are necessary for clinically ambiguous areas.[14] In theory, this can also result in more efficient surgeries by decreasing the number of stages required and therefore minimizing the time that the patient needs to be in office. Similarly, real time RCM and video-mosaicking have been used in Moh's surgery for intraoperative evaluation of surgical wounds to detect the presence of residual tumor cells as an alternative to the labor intensive, time consuming process of frozen sections.[15]

Although RCM proves to be very promising, there are some limitations to this imaging method. The process of image acquisition can be time consuming, ranging from several minutes to up to an hour, with the average lesion taking about 20-30 minutes.[16] Image interpretation is additionally time consuming and therefore should be performed by experienced operators for maximal efficiency.[6] To this end, operators should be adequately trained prior to attempting image acquisition and interpretation. This process has been estimated to take about 4 to 6 months as well as a fundamental understanding of histology and dermoscopy, and the evaluation of thousands of cases prior to obtaining an acceptable level of diagnostic expertise.[6] However, there are many, emerging, training resources available for clinicians today: online courses (Confocal 101), textbooks (Reflectance Confocal Microscopy for Skin Diseases) and conferences (MSK's Annual Basic Course in RCM: Non-Invasive Diagnosis of Skin Cancer). Sufficient training is paramount, and it is recommended that dedicated long-term staff acquire images due to the lengthy learning curve.[17]

As previously mentioned, the maximum depth of RCM is about 150 µm, after which the resolution significantly decreases, which limits the clinician's ability to detect the tumor depth, posing challenges for evaluation of nodular, hyperkeratotic, or ulcerated lesions.[6] A proposed method to overcoming this barrier is to couple RCM with Optical Coherence Tomography (OCT) as it has the ability to penetrate deeper into the skin but lacks the clarity and precision of RCM. By combining these two imaging modalities, practitioners are able to improve their diagnostic capabilities at the bedside as well as broaden the scope of care that they can provide for patients.[18]

Another limitation is availability and affordability of these commercial devices. Because these devices can be expensive to obtain, it is rare to find them in an outpatient, nonacademic setting. However, these devices are now available to lease and since the procedure can be reimbursed through insurance, there is increased incentive for clinicians to introduce these devices into their practices.

It is evident that RCM can be utilized in a variety of ways in clinical practice, and it is now recognized as a billable procedure. Unfortunately, the VivaScope 1500 is the only device with approved CPT codes including acquisition of images (96932), image interpretation and production of a report (96933), amongst others.[6] To ensure reimbursement, one must obtain 3 to 5 mosaics at varying depths and stacks at points of interest or concern. The reimbursement for obtaining and interpreting images of a single lesion (96931) is approximately $175, and then $100 for each additional lesion (96934).[19]

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Megan Dauscher, MS, PA-C, *is a physician assistant for the Dermatology Service at Memorial Sloan Kettering Cancer Center in Hauppauge, New York, and a guest lecturer and Master's Thesis Advisor of the Hofstra University Physician Assistant Studies Program in Hempstead, New York.*

Rachel Manci, BS, *is a Medical Student Fellow in Dermatology at Memorial Sloan Kettering Cancer Center in Hauppauge, New York.*

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Address for Correspondence: *Megan Dauscher, MS, PA-C; mdausc1@pride.hofstra.edu*

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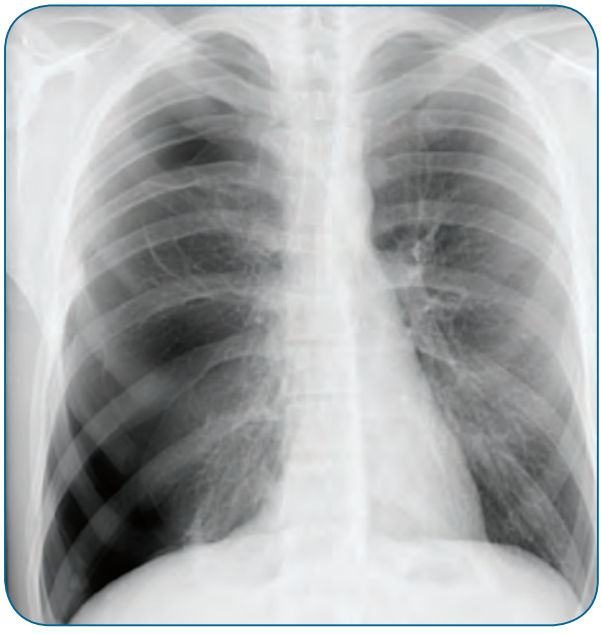
Certification Review

All Those Things Inside the Skin You Might Have Forgotten

By James A. Van Rhee, MS, PA-C

Are you recertifying soon? Start your board review early. Each issue of the JDPA features one board question accompanied by a brief explanation of the answer along with any pertinent test taking tips. Best of luck!

QUESTION: A 25-year-old man presents to the emergency department with shortness of breath and pleuritic chest pain. Oxygen saturation is 94%. Chest x-ray is noted below.



Which of the following is the most likely physical examination findings?

A. Decreased tactile fremitus, resonant to percussion, without dullness, breath sounds present
B. Absent tactile fremitus, hyperresonant to percussion, breath sounds absent
C. Absent tactile fremitus, dull to percussion, breath sounds decreased
D. Increased tactile fremitus, dullness to percussion, crackles present

EXPLANATION: The adult patient should have several immunizations updated on a regular basis. One dose of tetanus, diphtheria, pertussis (Tdap) should be given and then a Td or Tdap booster every 10 years. Influenza recombinant (RIV) should be given annually. Pneumococcal polysaccharide (PPSV23) should be given as a single dose. Varicella (VAR) is contraindicated in patients who are immunocompromised since the vaccine contains live, attenuated virus. Other live vaccines given to adults include measles, mumps, rubella (MMR), smallpox, and yellow fever.

The correct answer is B.

James A. Van Rhee, MS, PA-C, *James A. Van Rhee, MS, PA-C, is the Program Director for the Yale University School of Medicine Physician Associate Program. Mr. Van Rhee has been involved in physician assistant education for over 20 years. He has served as project director and test item writer for the Physician Assistant Education Association's (PAEA) Physician Assistant Clinical Knowledge Rating Assessment Tool (PACKRAT). He is the author of the Physician Assistant: Certification and Re-certification Review Book and Consulting Editor of Physician Assistant Clinics, both published by Elsevier. For the last fifteen years he has been course director and presenter of the Physician Assistant Board Review, produced live online by Kaplan Medical.*

Reference: https://medpix.nlm.nih.gov/case?id=60999e0b-8a1a-4511-af92-7c1bfb1f6882

A Memorable Virtual Conference Experience that Combined Education with Gamification to Successfully bring Together the Derm PA Community

In 2020, we saw wide-scale adoption of telecommunications. An ever-changing variable to all aspects of planning, the COVID-19 pandemic accelerated us to move virtually all interactions, well, virtual. Traditional in-person events were either completely canceled or re-formatted to take place exclusively in the virtual setting. This response required a reimagining of how people come together to deliver education, share ideas, and network. While the obvious solution on how to socialize while remaining socially distant was to "go virtual," hosting a conference completely online was largely uncharted territory and presented a multitude of technological challenges.

For the Society of Dermatology Physician Assistants (SDPA), extensive reconstruction of its Fall 2020 conference (originally scheduled to take place in person in Miami, Florida) required an all-hands-on-deck approach and collective enthusiasm to embrace the challenge of pivoting to a 100-percent virtual conference. SDPA Digital—a unique and innovative virtual conference experience—succeeded in remotely delivering the same high-quality, interactive education for which SDPA is known and fostering the same comradery among the Derm PA community traditionally seen at a live event.

EDUCATION

SDPA responded to member needs by offering 47 hours of free continuing medical education (CME) in the form of on-demand educational sessions from previous conferences and a webinar series titled, "Empowering the Dermatology PA during the COVID-19 Crisis and Beyond." When the Board of Directors made the difficult decision to hold a fully virtual conference experience in lieu of its planned in-person meeting in sunny Florida, society leadership and staff already had a working backup plan.

SDPA Digital 2020, launched October 29, 2020, brought the look and feel of education offered at in-person meetings, with a combination of live and pre-recorded presentations and the opportunity to ask presenters questions and get their answers in real-time. Sessions covered a variety of topics relevant to the derm PA audience. From the staples of medical education—review of the literature, updates on disease states—to the more focused deeper dialogues, SDPA Digital's conference agenda was designed to deliver a comprehensive learning experience.

SESSION HIGHLIGHTS & KEY TAKEAWAYS

What's New in the Literature?

SDPA Digital 2020 Medical Director Joslyn S. Kirby, MD, MS, MEd from the Department of Dermatology at Penn State Milton S. Hershey Medical Center in Hershey, Pennsylvania, kicked off Day 1 of educational sessions with a review of the literature.

Much of the literature in 2020 focused on COVID-19 findings and pandemic-related topics. Dr. Kirby reflected on the early days of the pandemic, when reports of "COVID Toes" circulated, and said this initially sparked "real hope and optimism" among healthcare providers who originally thought that such a visual, tell-tale symptom could potentially help them recognize COVID in patients and intervene early. She underscored the importance of remembering that skin rashes, such as morbilliform rashes and chilblain-like lesions, seen during the pandemic were not definitive of a patient testing positive for the virus, but rather skin manifestations known to have other causes.

She addressed how COVID health and safety responses like increased hand washing and extended use (>6 hours of wear) of personal protective equipment, especially in front-line workers, affected the skin. Next, she provided an overview on how the pandemic impacted patients on maintenance therapies like biologics and small molecule therapies, describing recommendations from the recent body of literature as well as her own practice's experience. The main takeaway from the discussion was that, according to the literature, it is safe for patients to initiate and maintain effective biologics as there is no evidence of increased rates of severe COVID symptoms among this patient population as compared to patients not on biologics.

Dr. Kirby highlighted an American Academy of Dermatology clinical practice guideline of care for the management of primary cutaneous melanoma that included updated treatment recommendations for patients with primary cutaneous melanoma. Key updates to the guidelines were as follows: 1) the reporting of thickness to the nearest 0.1 mm rather than to the nearest 0.01 mm (e.g., a thickness of 0.75 to 0.84 mm would be rounded to 0.8 mm) and 2) Microsatellitosis should not be included in this primary tumor measurement but commented on separately, and 3) transit or satellite lesions will automatically move a melanoma into a stage 3 or higher category.

Other topics touched upon in this presentation were as follows:

- Inspection, biopsy, histology, and risk factors for re-occurrence of basal cell carcinomas
- Surgical scar revision technique comparisons.
- *Takeaway: No difference in scar improvement scores between ablative and nonablative fractional lasers.*
- What's Out There: Potential applications of platelet-rich plasma (PRP)
- Needs of transgender individuals and how dermatology care providers can address them with neurotoxins and fillers.
- *Takeaway: We can use our tools to help people live in their bodies*
- There have been updates on approvals of drugs indicated for atopic dermatitis. Dupilimuab is now approved for patients six years of age and older.
- *Takeaway: Counsel patients on "what to expect and what to do" if they experience adverse events; injection site reactions (most common), conjunctivitis, and keratitis.*
- Biologics newly improved for pediatric patient population (ages 4 and older) for psoriasis treatment.
- Janus kinase (JAK) Inhibitors for Alopecia Areata: Research shows great improvement in hair growth; however, it is important to note that it can take a while (i.e., up to one year of continued use) according to the recent studies.
- *Takeaway: Maintenance therapy is needed when treating AA with JAK inhibitors*

What's New in Management in Skin of Color?

Faculty member Temitayo A. Ogunleye, MD, Assistant Professor of Dermatology at the University of Pennsylvania, Department of Dermatology, in Philadelphia, Pennsylvania, reviewed common dermatologic disorders, examined recent research, provided an overview of literature, and reviewed practice changes that may help mitigate bias in skin of color patients. She listed the following key takeaways from the presentation:

Psoriasis

1. Black patients are less likely to use biologics for moderate to severe disease.
2. Black patients are more likely to be unfamiliar with biologics and careful counseling may help guide therapy.
3. We should adequately educate our skin of color patients about all options available for treatment for severe disease.

...Continued on page 41

Gamification. When not "in session," leadership, faculty, and attendees met in the various networking lounge chat rooms, visited booths in the interactive exhibit hall, and perused the poster "hall" and digital abstracts guide, highlighting the latest research in dermatology. Attendees quickly got the hang of "gamification" features and competed for top spots on the conference Leaderboard. They gained points by watching sessions, visiting exhibit booths, and viewing posters; adding educational resources to their digital "swag bags;" testing their skills in the mole game; and participating in a Halloween-themed scavenger hunt (Yes, that was Freddy Kruger greeting you at the lobby elevators). *See Gamification Sidebar for a list of contest winners.*

SDPA 2020 DIGITAL

GAMIFICATION STATION

GRAND PRIZE WINNER

Rekha Satyaprakash

2nd Place: Huntley Sanders
3rd Place: Christi Saklad-Costell
4th Place: Ashley Henes
5th Place: Kristin Patzkowsky
6th Place: Elizabeth Morton

SDPA 2020 DIGITAL LEADERBOARD

SCAVENGER HUNT

WINNER

Sarah Yoho

2nd Place: Victoria Cialfi
3rd Place: Carla Bailey

SDPA MOLE MASTER

Mandy Criado

2nd Place: Lia Basso
3rd Place: Jessica Rein
4th Place: Michael Barto

Spooktacular #SDPAPumpkin Contest

WINNER

Shelby Lueders

Inspired by Breast Cancer Awareness

2nd Place: Melissa Isennock Hutzler
3rd Place: Christi Saklad-Costello

Spooktacular #SDPACostume Contest

WINNER

Ashwin Kumar

2nd Place: Kelsey Wolford
3rd Place: Courtney Phenix

Congratulations & Thanks for Playing!

Listening To Patients
Is Gustav Next?

By Alan Rockoff, MD

Thursday was a rough day. Not for me, but for my front-desk personnel. I wouldn't even have known, if Nilda hadn't clued me in.

"I'm a preschool teacher," she said, after asking about Botox for underarm sweating. "So I have a lot of patience. But your front-desk people are amazing."

"What do you mean?" I asked her.

"This lady walks in without an appointment," she said. "Several people are trying to check in, and she just waltzes over and says, 'The doctor said I could come in whenever I wanted.'"

I smiled. "That's Harriet. She's worried she has an infection. We make allowances for people over 90."

"And then there was a woman who didn't even want to be seen," Nilda went on. "She'd gotten a bill she didn't approve of, and she kept going on and on.

"Your secretary said she would call the insurance company to look into it, but the woman kept saying, 'I've been a patient here for 20 years, and there's never been a problem with the insurance.'

"It would have been fine for your secretary to politely tell the woman she'd take care of it but now she had to get back to patients trying to register. But she didn't lose her cool, just kept repeating that she would call the patient's insurer and let her know."

I thanked Nilda very much for the feedback. "Most people don't bother to comment unless they have a complaint," I said, "so I appreciate your taking the time to say something positive. I'll be sure to pass it on."

"And I thought pre-school children were tough," said Nilda.

At lunch, I asked the staff what had been going on.

"Must be a full moon," said Irma, her eyes twinkling. "The registration desk was like a zoo anyway, what with all the new patients and old ones who hadn't been here in years re-registering. And in the middle of it all, a lady whose husband had already checked in and sat down kept calling out, "Is Gustav next?" The man sitting next to her—must have been Gustav himself—grumbled at her to please keep quiet, but she kept calling out, "Is Gustav next?"

"Then Dorit comes in, complaining about her bill. It turns out that her insurance changed in May, but she had forgotten about it, and she didn't understand what the change would mean for payment. I told her I would call her insurer and find out.

"'I've been a patient here for 20 years,' she kept saying. So, don't overcharge me!'

"I told her I would let her know what her insurer said and promised that we wouldn't overcharge her on the co-pay.

"In the meantime, Harriet, the walk-in, kept standing in front of the window saying, 'Doctor Rockoff said I could come in whenever I want, and my son-in-law took off work to bring me in and he's waiting outside.'

"And while Harriet was saying that, the lady in the chair kept calling out, 'Is Gustav next? Is Gustav next?'"

I smiled to myself, trying to think of which absurdist playwright could do justice to what went on that morning in my waiting room, or maybe in lots of mornings and afternoons in waiting rooms everywhere.

"You should know," I told Irma and the rest of the staff," that one of the patients commented on how well you all did. You handled all that insanity while staying cool and polite. Great job."

Of course, we have to stay vigilant for rude or discourteous behavior on the part of our staff. But that same staff often protects us from some pretty unreasonable behavior patients sometimes can throw at them. It makes sense to make a point of telling our front-desk representatives from time to time how much we appreciate the graceful way they handle the guff they may have to put up with and protect us from.

Meantime, I am working on my new drama, a sequel to Waiting for Godot. I will call it, Is Gustav Next?

He was gone by the end of the day, so I guess that at some point Gustav actually was next.

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.

SDPA Digital Synopsis 2020

...Continued from page 39

Alopecia

1. African Americans may have higher odds of alopecia areata compared with whites and that Asians may have lower odds of the disease.
2. Physicians should be aware of possible racial disparities in alopecia areata.
3. Consider this diagnosis in atypical presentations of alopecia.

Acne

1. Minority populations may receive fewer prescriptions for system treatment of acne such as oral contraceptives, spironolactone, oral antibiotics, and isotretinoin.
2. Remember to offer systemic therapies (and discuss risks appropriately) in your Black, Latino and Asian patients.

Melanoma

1. Black patients had longer time from diagnosis to definitive surgery (TTDS) for melanoma than Non-Hispanic White patients after other sociodemographic factors were controlled for, and racial differences in TTDS persisted after stratification by insurance type and melanoma stage.
2. Although type of melanoma and controversies in treatment may play a role in this disparity, consciously make an effort to ensure timely treatment for your Black patients with melanoma.

Update on Infectious Diseases

Robert G. Micheletti, MD, Assistant Professor of Dermatology and Medicine, Chief of Hospital Dermatology Director, Cutaneous Vasculitis Clinic, Penn Vasculitis Center at the University of Pennsylvania provided an update on infectious disease. First, Dr. Micheletti reviewed the latest literature on cutaneous manifestations of COVID-19, detailing the five major clinical patterns of skin involvement in patients with COVID-19:

1) Chilblain-like—violaceous erythema on fingers /toes
2) Vesicular eruption—small monomorphic vesicles
3) Urticarial lesions—trunk and extremities
4) Morbilliform—some cases pityriasis rosea-like or pseudovesicular
5) Livedoid—vasculopathy/coagulopathy

Other topics discussed included sexually transmitted infections with particular focus on the diagnosis and treatment of syphilis, infections in the immunosuppressed patient, and classic presentations of Lyme disease, Rocky Mountain Spotted Fever and dengue. Dr. Micheletti emphasized that numerous common and uncommon infectious processes may involve the skin, and that skin findings may be the presenting sign/symptom of an important systemic infection. He encouraged providers to keep an open mind and approach skin findings in the context of the patient's overall medical situation. It is important to recognize how immunosuppression plays an important role in infections and that timely dermatology input may be critical.

The SDPA is pleased to announce our

ARIZONA
Anna Kryuchina, PA-C
Elena Salpas, PA-C
Amanda Smallwood, MPAS, PA-C

CALIFORNIA
Avis Chiu, PA-C
Taylor Leigh, PA-C
Kristine Nguyen, PA-C
Jennifer Nossokoff, PA-C
Sarah Taylor, MPAS, PA-C
Kari Walen, MPAS, PA-C

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Sheena Chand, PA-C
Jeremy Hubbard, PA-C
Jason Kraemer, MMS, PA-C

DELAWARE
Paige Venables, PA-C

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Jessica Bussey, PA-C
Ahresh Edjlali, MS, PA-C
Hector Gonzalez, MPAS, PA-C
Rachel King, MPAS, PA-C
Christi Saklad-Costello, MPAS, PA-C
Meylin Vega, MMS, PA-C
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Mayra Zimmerman, MPAS, PA-C

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Joy Stutrud, PA-C

MISSOURI
Amanda Lawrence, PA-C
Amy Willingham, MPAS, PA-C

NEBRASKA
Kerri Otto, PA-C

most recent Diplomate Fellow Members!

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Brianne Madsen, MPAS, PA-C

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Jacqueline Gordon, MPAS, PA-C

NEW JERSEY
Megan McCrea, MPAS, PA-C
Carley Palmer, MS, PA-C

NEW MEXICO
J. Monique Beyerle, MHS, PA-C
Emily Bryl, PA-C

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Sarah Biedermann, MMS, PA-C
Caitlin Cook, MPAS, PA-C
Patrick Franck, PA-C
Sarah Hambleton, PA-C
Yvonne Huang, MPAS, PA-C
Chloe Huggins, MPAS, PA-C
Rikki Korkowicz, MPAS, PA-C
Karl Kruszynski, PA-C
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Pamela Lachs, MPAS, PA-C
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Dermatology Market Watch

Ortho Dermatologics Announces 2021 Aspire Higher Scholarship Program

Students Living with Dermatologic Conditions Are Encouraged to Apply Through May 31, 2021

Bausch Health Companies Inc. ("Bausch Health") and its dermatology business, Ortho Dermatologics, one of the largest prescription dermatology health care businesses, announced the opening of the application process for its 2021 Aspire Higher scholarship program. The program, which began in 2013, will award nine students who have been treated for a dermatologic condition with a scholarship of up to $10,000 in support of their academic goals.

"Many students today are balancing a mix of in-person and remote education in addition to managing part-time jobs and extra-curricular activities. In normal circumstances, it can be challenging for students to juggle all that is part of getting an education, and with the added physical and emotional burden of living with a skin condition during a worldwide pandemic, it's even more difficult," said Scott Hirsch, senior vice president and chief strategy officer, Bausch Health, and president, Ortho Dermatologics. "We are excited to continue the Aspire Higher scholarship program in 2021 and to assist deserving students as they work to achieve their academic goals."

To apply for the 2021 scholarship, students are required to submit letters of recommendation along with a long-form essay describing the impact of their dermatologic condition and the role that a dermatologist, physician assistant or nurse practitioner has played in helping to treat their condition. Scholarships are open to applicants who have been accepted to, or students currently attending, an accredited, nonprofit, two- or four-year college, university or advanced (post-high school) vocational or technical school for the 2021-2022 academic year.

Scholarships are available in the following three categories:

- Undergraduate Scholar Awards for students pursuing undergraduate degrees
- Graduate Scholar Awards for students pursuing graduate degrees
- Today's Woman Scholar Awards for students who are mothers pursuing either undergraduate or graduate degrees

"For several years, I've tackled a chronic skin disease while fighting to accept myself with this condition," said Magdalena Augustine, a 2020 Aspire Higher scholarship recipient. "The Aspire Higher Scholarship Program has made that fight so much easier by recognizing students like me who are living with skin conditions and helping to support our higher education aspirations."

Students can apply for the Aspire Higher scholarship through May 31, 2021, and winners will be announced in July 2021. To learn more about the scholarship, including eligibility criteria, terms, and conditions, and to see stories from previous winners, please visit www.AspireHigherScholarships.com.

Schweiger Dermatology Group Launches Skin of Color Specialty Clinic to Better Address the Needs of Patients with Darker Skin Types

Schweiger Dermatology Group (SDG), the leading dermatology practice in the Northeast, has launched a Skin of Color Specialty Clinic to meet the needs of patients with darker skin types. SDG has assembled a team of providers with the expertise and understanding of diverse skin types to launch this division within the practice.

Sumayah Jamal, MD-PhD is the program director for the Skin of Color Specialty Clinic at Schweiger Dermatology Group. Dr. Jamal served as Founding Director of the Ethnic Skin Clinic at New York University School of Medicine. Before she started the clinic, there were few options available for patients of color seeking cosmetic treatments at N.Y.U. due to a lack of providers familiar with treating their skin.

"As a premier provider of skin care services, Schweiger Dermatology Group recognizes the importance of addressing the needs of a patient population with ever increasing diversity," says Dr. Jamal. "This requires providers who have an understanding of not only how to

deliver cosmetic treatments safely to darker skin types, but who also understand the differences in how certain medical conditions present within this patient population."

The additional providers helming Skin of Color at Schweiger Dermatology Group include Dr. Kautilya Shaurya, Dr. Erum Ilyas, Dr. Christina Lee Chung, Dr. Rina Allawh, Kendra Joseph, PA-C, and Tinuke Aderemi-Ibitola, PA-C. These providers were selected specifically for their expertise in Skin of Color, allowing SDG to offer the high standard of care they are known for, tailored specifically to patients with darker skin types. Skin of Color at Schweiger Dermatology Group will be a continued initiative, as Dr. Jamal and her team focus on training and educating additional providers throughout the practice.

For more information visit http://schweigerderm.com/medical-dermatology/skin-of-color-specialty-clinic

Galderma and AKLIEF® (trifarotene) Cream, 0.005% Unveil Me Being Me Campaign to Inspire Young People with Acne to Live Life to the Fullest

New Survey Data Reveals Impact of Today's Digital World on Teens and Young Adults Suffering from Acne and Renewed Interest in Seeking Skincare Solutions from a Dermatologist

Galderma Laboratories, L.P. and AKLIEF® (trifarotene) Cream, 0.005%, announced the launch of Me Being Me, a new consumer campaign, crafted in response to today's increasingly digital-focused world, aimed to shed light on the powerful connection between acne and self-confidence impacting many teens and young adults. The campaign is designed to inspire those living with acne to feel confident in their own skin by sharing stories of real people with acne that are boldly living their best lives while arming them with the information they need to talk to their dermatology provider about AKLIEF Cream, which contains the first retinoid molecule approved by the U.S. Food and Drug Administration (FDA) in 20 years for the treatment of acne vulgaris. The multi-channel effort includes paid and organic social media, influencer activations and strategic content partnerships as well as a new creative advertising campaign and online hub launching in spring 2021.

Acne is the most common skin condition in the United States, often impacting self-esteem and confidence levels,[1,2] and unfortunately is greatly affecting the way many sufferers are living their lives during the current social distancing age. A recent survey conducted by Galderma, in collaboration with Wakefield Research*,[3] revealed that frequent on-camera time is discouraging acne sufferers from fully participating in their virtual environments. In fact, the overwhelming majority (86%) of acne sufferers have been distracted by their acne on a video call, often missing what others are saying.[3] That's if they even turn the camera on at all, as over half (62%) opt to turn their cameras off during video calls, sometimes even faking technical glitches to avoid the on-screen time.[3]

Furthermore, the survey revealed that half of students with acne (50%) say their acne has had a negative impact on their grades and academic achievement, and more than three in five young professionals who have had a video call (62%) say their acne has hindered their professional growth.[3] Fortunately, despite the distraction, nearly two-thirds (64%) of respondents who are spending more time on video calls are also now feeling more motivated to seek help from a dermatologist.[3]

For the full interactive multichannel news release, including important safety information, fact sheet, and infographic, visit https://www.prnewswire.com/news-releases/galderma-and-aklief-trifarotene-cream-0-005-unveil-me-being-me-campaign-to-inspire-young-people-with-acne-to-live-life-to-the-fullest-301234114.html

**The online survey, conducted in December 2020 among 2,000 U.S. consumers ages 14-29 suffering from facial and truncal acne, was developed by Galderma Laboratories, L.P and Wakefield Research.*

1. American Academy of Dermatology. Acne. https://www.aad.org/media/stats/conditions. Accessed August 23, 2019
2. American Academy of Dermatology. Acne can affect more than your skin. https://www.aad.org/public/diseases/acne-and-rosacea/emotional-health-effects-of-acne. Accessed August 23, 2019.
3. Galderma Laboratories L.P. Data on File. Wakefield Research AKLIEF Cream Survey Raw Data Readout. December 2020.

Findings About the Effectiveness of Total-Body Skin Cancer Exams and Concerns About Cancer Management Delayed by COVID-19 Earn Advanced Dermatology Researchers National Attention

Concerns over the magnitude of COVID-19's effect on the timely detection and management of melanoma and non-melanoma skin cancers has led an elite team of researchers, including Dr. James Solomon and Dr. Matt Leavitt of Advanced Dermatology and Cosmetic Surgery, to participate in research that has been published in the January 19, 2021 edition of the Journal of the American Academy of Dermatology (JAAD).

Dr. Solomon and Dr. Murray Cotter also participated in a recent study that demonstrated the effectiveness of total-body skin cancer exams, which was published in the Journal of Clinical Oncology®, an American Society of Clinical Oncology (ASCO) Journal.

"Reduced access to care due to COVID-19 has raised concerns that patients with potential skin cancers may have had material delays in detection and care," said Dr. Solomon, who is the Director of Research and Principal Investigator of Ameriderm Research, the research division of Advanced Dermatology. "This study assessed the magnitude of delays in initial skin cancer diagnosis and management."

With institutional review board approval, data from January 2019 to August 2020 were analyzed from available outpatient-chart reviews of 143 US dermatology practices (350 providers) covering 4.7 million patients across 13 geographically distributed states. The number of diagnosed cutaneous melanomas, cutaneous squamous cell carcinomas (SCCs), and basal cell carcinomas (BCCs) was determined.

"Total 2020 skin cancer diagnoses trailed that of 2019, with 279 fewer cutaneous melanomas, 6000 fewer cutaneous SCCs, and 9914 fewer BCCs detected," said Dr. Solomon. "Extrapolating these findings to the full US population (330 million), an estimated 19,600 cutaneous melanomas, 421,300 cutaneous SCCs, and 696,100 BCCs have had materially delayed initial diagnosis or treatment."

"Although skin cancer diagnoses have now returned to the same-month 2019 baseline, our findings suggest that a large backlog of skin cancers remains undiagnosed. These delays may lead to skin cancers presenting at more advanced stages," he said.

The ASCO published study explored the effectiveness of dermatology providers performing total-body skin cancer exams versus partial skin exam screenings and concluded that skin cancer is detected at significantly higher rates using total-body skin cancer exams. In fact, it concluded a total-body skin cancer exam is 23.5 times more likely to identify a melanoma than a Pap smear is to identify a cervical cancer.

"The bottom line is that skin cancer didn't take a break due to COVID-19," said Dr. Solomon. "If you're due for your annual total-body skin cancer exam, get it on your calendar. We're taking strict safety measures to protect your health and to give you the peace of mind to get the care you need."

To read the full article published in JAAD, visit https://www.jaad.org/article/S0190-9622(21)00082-7/fulltext

New Report Gives Glimpse Into Certified Physician Assistants in Medical Specialties Before COVID-19 Pandemic

Just before the onset of the COVID-19 pandemic in the United States, the Certified Physician Assistant workforce continued to grow, expanding the number of Certified PAs available to meet rising demands for specialty medical providers.

According to the 2019 Statistical Profile of Certified Physician Assistants by Specialty, an annual report issued by the National Commission on Certification of Physician Assistants (NCCPA), the number of Certified Physician Assistants grew 28.5% between 2015 and 2019. The top five specialties in which Certified PAs practiced are: Family Medicine/General Practice (18.6%), Emergency Medicine (12.8%), Other (9.3), Internal Medicine-General Practice (4.5%) and Dermatology (4.1%). The report also provides first time data on Certified PAs' telemedical practice patterns before the pandemic, which stood at 9.2%.

Physician assistant is consistently ranked as one of the top jobs in America, most recently by U.S. News and World Report as #1 in the Best Health Care Jobs of 2021.

For the full release, including additional key findings from the report, visit http://www.nccpa.net

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