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Reducing waste in dermatologic surgery

By Divya Sharma, MD, Annika Belzer, MD*, MHS, Raj Fadadu, MD*, and Mary Maloney, MD, FAAD

When providing care, daily decisions, such as waste disposal protocols and instrument selection, may be seen as inconsequential. However, when aggregated, these decisions may generate a substantial environmental footprint and can have significant financial implications.

Consider telehealth visits

When performing a surgical consultation, the physical exam is often critical for evaluating tumor features. However, certain low-risk tumors may not require an in-person consultation prior to surgery. Similarly, for low-risk patients who have undergone simple repairs, telehealth follow-up appointments are often appropriate. Switching to a telehealth format in certain clinical scenarios can reduce carbon emissions associated with patient transportation to pre- and post-operative visits.[1,2]

Dispose waste conscientiously

A significant amount of medical waste is created during dermatologic surgery and cosmetic procedures. A large portion of this waste is not conventional "red bag waste" in the sense that it does not require special elimination practices (incineration or autoclaving). Nevertheless, busy physicians and staff often dispose of waste in the receptacle that is most convenient. The result is more incinerated waste, unnecessarily increasing the environmental footprint and financial cost of one's practice.[3] Simple and non-burdensome interventions to prevent this include educating staff, clearly labeling waste receptacles, and strategically placing waste bins.

Re-evaluate instrument selection

Choosing to utilize reusable or disposable instruments for surgery and suture removal is often a personal decision. Disposable instruments may offer convenience, while eliminating the need for on-site sterilization. However, disposable instruments contribute significantly to landfill mass. Transitioning to high-quality, reusable, stainless steel instruments can reduce long-term financial costs and waste.[4]

Transition to non-sterile gloves in appropriate clinical settings

Numerous studies have shown that when taking a Mohs layer, non-sterile gloves do not confer an

see **WASTE** on p. 3

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WASTE from p. 1

increased risk of surgical site infection when compared to their sterile counterparts.[5,6] Using non-sterile gloves can significantly reduce the waste produced from multi-layered packaging of sterile gloves.

Suture choice and technique

In the correct clinical setting, use of absorbable rather than non-absorbable sutures can provide comparable outcomes while also eliminating follow-up visits for suture removal.[4] This eliminates medical waste associated with a second visit (e.g., gloves, gauze, etc.) and reduces patient travel emissions.

Sustainability in dermatology does not require sacrificing patient safety, compromising clinical outcomes, or increasing financial burden. For residents, developing "green" surgical habits early on in training through conscientious waste segregation, evidence-based glove utilization, and thoughtful instrument selection ensures that one's transition to independent practice is rooted in high-value care with low environmental impact. Ultimately, a sustainable practice is a practice that promotes patient health and planetary health in conjunction with thoughtful fiscal decision-making.

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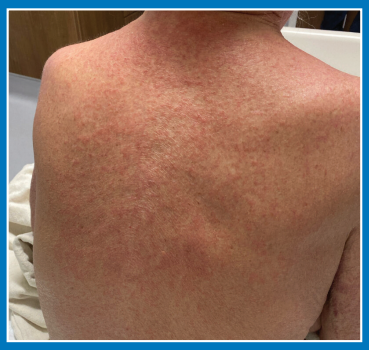
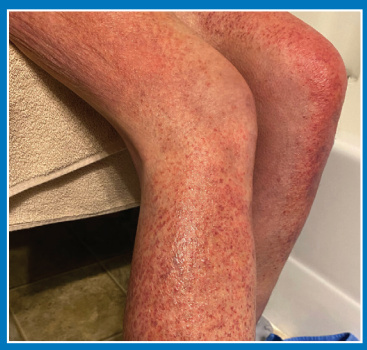
Race for the Case

By Nancy Shen, MD





A 61-year-old female with history of acute myeloid leukemia (AML) status-post unrelated donor stem cell transplant two months prior presented to the hospital with two weeks of an itchy rash that first appeared on her legs. The patient reported spread of the rash to her face, chest, and back over the past week, although denied blistering, burning, or pain at involved areas. On exam, there were erythematous patches and plaques with thin scale present over the chest, back, and upper and lower extremities, affecting approximately 40% of her body surface area. The patient did not have mucosal involvement and no bullae were present. The patient denied all other symptoms including fever, chills, dyspnea, abdominal pain, vomiting, diarrhea, and urinary changes. She also denied any recent changes in her medications preceding the rash.

Laboratory evaluation was remarkable for chronic thrombocytopenia. Urinalysis, bilirubin, and liver enzymes were normal. A 4-millimeter punch biopsy was obtained from the upper back and submitted for hematoxylin and eosin (H&E) staining. The biopsy returned with vacuolar interface dermatitis with mild perivascular infiltrate in the superficial dermis. Interface change with necrotic keratinocytes extended down epithelial adnexal structures.

1. **What are the three most common organs affected in graft-versus-host disease (GVHD)?**
2. **What is the underlying immunologic cause of GVHD?**
3. **What is the time cutoff between acute and chronic cutaneous GVHD?**
4. **What stage and chronicity of skin GVHD does this patient meet?**
5. **What is the first-line systemic treatment for this patient?**
6. **What are four common cutaneous manifestations of chronic GVHD?**

Respond with the correct answers at **www.aad.org/RaceForTheCase** for the opportunity to win an Amazon gift card!

Race for the Case winner (Spring 2026)

The winner of the spring 2026 Race for the Case is Nancy Shen, MD, a PGY-3 at WashU School of Medicine in St. Louis. Dr. Shen correctly identified pemphigus vulgaris in our latest Race for the Case and provided the most accurate responses in the quickest time. Congrats to Dr. Shen!

You can read more about this case online at **www.aad.org/race-case-answers**. If you can solve the case above, there may be a $100 Amazon gift card in your future, and you will be invited to contribute your very own Race for the Case. Visit **www.aad.org/RaceForTheCase**.

Eosinophilic spongiosis differential diagnosis = HAAPPIE

By Shannon Hart, DO, Nathaniel A. Marroquin, DO, and Ryan Ottwell, DO, FAAD

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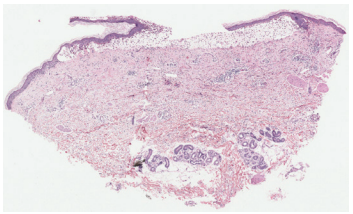
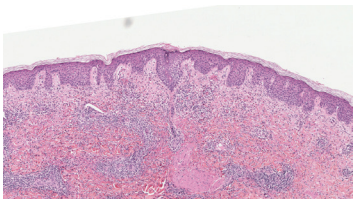
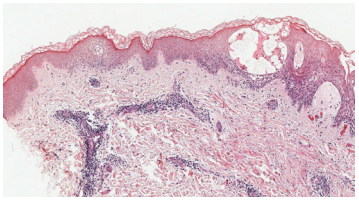
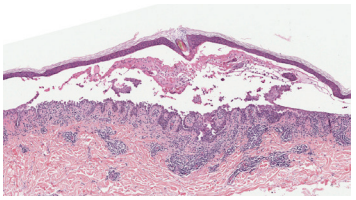
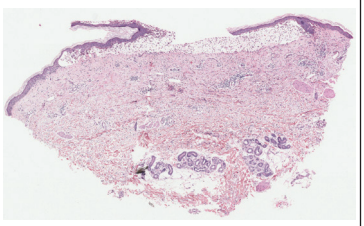
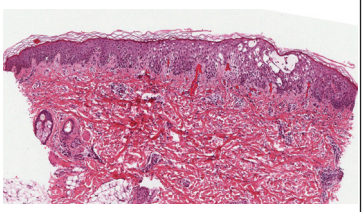
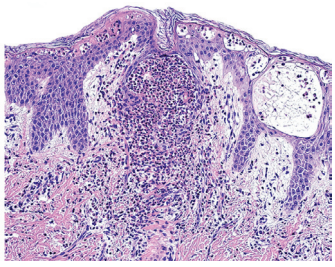
Diagnosis	Histopathologic features	Other important fodder	Histology image*
H: Herpes gestationis (pemphigoid gestationis)	• Subepidermal blister with eosinophils ± neutrophils • Eosinophilic spongiosis • Papillary dermal edema	• Direct immunofluorescence (DIF) shows linear deposition of C3 along the basement membrane zone (BMZ), n-serrated pattern • Pattern is identical to bullous pemphigoid • Salt-split testing shows staining to the roof of the blister (epidermal side)	
A: Arthropod bite	• Wedge-shaped (V-shaped) superficial & deep perivascular infiltrate with eosinophils, lymphocytes, and histiocytes • Overlying spongiosis ± epidermal necrosis	• Pronounced spongiosis may lead to blister/bullae formation → bullous arthropod reaction • Flame figures may occur secondary to eosinophilic degeneration • Consider evaluating for underlying hematologic malignancy or latent Epstein–Barr virus infection in patients who present with atypical or exaggerated reactions to arthropod bites	
A: Allergic contact dermatitis (ACD)	• Characterized by spongiosis (spongiotic dermatitis) with acute, subacute, and chronic forms • Acute ACD characterized by a normal basket-weave orthokeratosis, spongiosis with eosinophilic exocytosis and a dermal inflammatory infiltrate comprised eosinophils, lymphocytes, and histiocytes • Pronounced epidermal edema may lead to vesicle formation • In subacute and chronic ACD, spongiosis becomes less prominent, and the epidermis shows acanthosis with overlying hyperkeratosis or parakeratosis	• Type IV delayed hypersensitivity reaction • Langerhans cell microabscesses in the epidermis are associated with ACD but are not specific for the diagnosis • No keratinocyte necrosis (vs. ICD which shows keratinocyte necrosis)	
P: Pemphigus (vulgaris)	• Intraepidermal blister • Suprabasalar acantholysis with preservation of basal keratinocytes, "tombstoning" • No keratinocyte necrosis • Blister cavity contains acantholytic keratinocytes and eosinophils	• DIF shows intercellular deposition of IgG and C3 • creating a "chicken-wire" pattern • Acantholysis may involve hair follicles (vs. Hailey-Hailey disease which spares hair follicles)	

Eosinophilic spongiosis differential diagnosis = HAAPPIE

By Shannon Hart, DO, Nathaniel A. Marroquin, DO, and Ryan Ottwell, DO, FAAD

Diagnosis	Histopathologic features	Other important fodder	Histology image*
P: (bullous) Pemphigoid	• Subepidermal blister with eosinophils ± neutrophils† • Eosinophilic spongiosis • Papillary dermal edema	• Perilesional DIF demonstrates linear deposition of IgG and C3 at the dermoepidermal junction, exhibiting an n-serrated pattern • Indirect immunofluorescence on salt-split skin reveals immunoreactant localization to the blister roof	
I: Incontinentia pigmenti	Vesicular stage: • Eosinophil-rich spongiosis producing intraepidermal vesicles with marked eosinophilic exocytosis • Scattered keratinocyte apoptosis may be seen Verrucous stage: • Marked hyperkeratosis and papillomatosis with minimal spongiosis and few eosinophils • Conspicuous dyskeratosis forming whorled and clustered aggregates within the epidermis and stratum corneum Hyperpigmented stage: • Evidence of pigment incontinence with multiple melanophages in the dermis Hypopigmented stages: • Thinning of the epidermis is present, along with reduced melanin within the basal layer • Pilosebaceous structures and eccrine sweat glands are entirely absent • Apoptotic keratinocytes may also be observed within the epidermal layer	• X-linked dominant disorder due to mutations in IKBKG (NEMO) gene • Vesicular stage observed at birth and up to 1 month of age • Verrucous stage observed up to 2 years of age • Hyperpigmented stage observed up to adolescence • Hypopigmented stage may be observed throughout adulthood • Note that necrotic keratinocytes are a classic finding	 Vesicular stage
E: Erythema toxicum neonatorum‡	• Subcorneal, intraepidermal, or intrafollicular pustules composed of eosinophils, with occasional neutrophils • Superficial dermal edema and eosinophilic infiltration	• Smear of pustule contents stained with Wright stain demonstrates numerous eosinophils	

** All histology slides were obtained from PathPresenter.com with their permission. The authors thank PathPresenter and the pathologists who contribute to their website.*

† Autoantibodies activate complement (→ neutrophil recruitment) and trigger a Th2 response with IL-5 (→ eosinophil recruitment); both cells release proteases that damage the dermal-epidermal junction and cause subepidermal blistering.

‡ Erythema toxicum neonatorum histology image permission was obtained from Dr. Ranata Joffe, originally published in Dermatopathology: Practical & Conceptual *(January to March 2006, Volume 12, Issue 1).*

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More study charts online!

There are more Boards Fodder charts online! In addition to the chart in this issue, you can view the **Lupus erythematous** chart by Fabiola Pabón-González, MD, Mariana Sadurní-García, MD, and Gerardo Caussade, MD, and the **Non-excisional management of non-melanoma skin cancer (NMSC)** chart by Kevin Varghese, MD, Sami Jelousi, MD, and Anna Clayton, MD, FAAD.

These and many more charts can be found at **www.aad.org/boardsfodder**.

Shari R. Lipner, MD, PhD, FAAD, is professor of clinical dermatology and director of the nail division at Weill Cornell Medicine.

Clinical Pearls

Clinical Pearls help prepare residents for the future by providing them with insights about what they should know about a specific subject area by the time they complete their residency.

Longitudinal melanonychia pearls

By Shari R. Lipner MD, PhD, FAAD

Pearl #1: Determine whether the pigment reflects melanocyte activation or melanocytic proliferation. Longitudinal melanonychia is a clinical pattern rather than a diagnosis. The key first step is determining the biological process responsible for the pigment. Melanocyte activation refers to increased melanin production without increased melanocyte number and may be due to medication or friction/trauma and are common in darker phototypes. These bands are often gray-brown, relatively uniform in color, and frequently involve multiple nails. Dermoscopy typically shows regular parallel lines with consistent spacing and thickness. Melanocytic proliferation reflects an increased number of melanocytes and may represent a nail matrix nevus or nail unit melanoma. Melanocytic proliferation often presents as a solitary band with brown to black pigmentation and irregular lines with variable thickness and spacing. Recognizing these patterns helps guide management. Melanocytic activation warrants observation, whereas suspicious for a melanocytic proliferation requires biopsy.[1]

Pearl #2: Approach the history and examination systematically. A careful, structured evaluation is essential. Ask the patient when the band first appeared, whether it changed in width or color, and any associated symptoms, including pain or bleeding. Document personal or family history of melanoma. Examine all 20 nails, because involvement of multiple nails often suggests benign activation, whereas a single affected nail is more concerning for a neoplastic process. Measure band width, estimate the percentage of nail plate involved, and inspect the nail folds and hyponychium for pigment. Dermoscopy should be performed routinely, and photography at every visit is highly recommended, as interval change is one of the most important clues.[2]

Pearl #3: Recognize clinical warning signs for nail unit melanoma. Certain features should heighten concern for nail unit melanoma, particularly in adults. These include a solitary band (especially involving the thumb, index finger, or great toe), progressive widening or darkening, band width >3 mm, involvement of more than 40% of the nail plate, irregular or heterogeneous dermoscopic lines, pigment extending onto the nail folds, and pain or bleeding.[3]

Pearl #4: Pediatric longitudinal melanonychia behaves differently. One of the most important distinctions to understand is that diagnostic rules for adults do not translate well to children. Nail unit melanoma is exceedingly rare in pediatric patients. Pediatric bands may be wide, irregular, or even show pigment involving the nail folds, and still represent benign nevi. The commonly cited 3-mm rule is therefore less useful in children. Instead, careful history, dermoscopy, serial photography, and longitudinal follow-up are often appropriate, with referral to a nail specialist if uncertainty remains.[4]

Pearl #5: Nail biopsy requires planning and expertise. Nail biopsy remains the definitive diagnostic test for sampling the nail matrix and distinguishing benign from malignant melanocytic nail unit etiologies. A tangential matrix excisional biopsy allows for sampling of the entire pigmented lesion while minimizing postoperative dystrophy. When invasive nail unit melanoma is strongly suspected, a longitudinal excision may be preferred to evaluate full-thickness involvement of the matrix, nail bed, and hyponychium. Punch biopsies could be considered for narrow bands but are less reliable diagnostically. Nail biopsies are technically demanding, and require prior training, while poorly planned biopsies may miss the relevant pigment or cause permanent nail deformity. If there is any uncertainty, referral to a dermatologist experienced in nail surgery is appropriate.[1] DR

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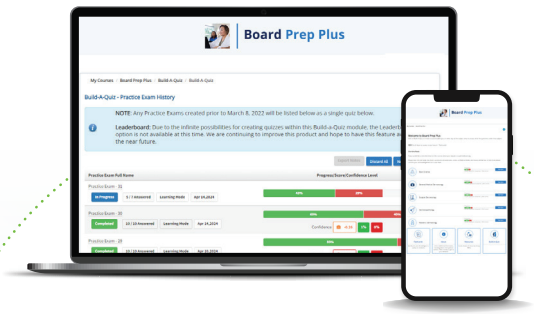

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Inside this Issue

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The mindful dermatologist

If you take a moment to reflect on what goes through your head when evaluating a patient, can you comprehensively articulate your thought process? While I have a methodology to my examinations, outlining every red flag or morphological clue I am searching for would be incredibly challenging. During dermatology training, we amass an almost overwhelming quantity of theoretical and practical knowledge. Our years of training ingrain a degree of instinctual mindfulness that allows us to synthesize the subtlest features into consequential diagnoses.

In reviewing this issue of *DermWorld Directions in Residency,* I reflected on how dermatologists are charged with honing and maintaining a particularly strong sense of mindfulness. It is humbling to be responsible for diagnosing the commonly referenced "more than 3,000 conditions" of the integument. As you all know, this also makes for a uniquely challenging residency experience.

When I first learned about non-bullous pemphigoid, I sighed. Having to suspect and diagnose a blistering condition in the absence of bullae succinctly summarizes the dermatology residency learning curve. I've caught this entity one time during my training, but was it only because I had been studying for my medical dermatology exam and it was fresh in my mind? It is imperative that we as dermatologists can recognize an atypical pruritic urticarial eruption and perform a direct immunofluorescence to cinch the diagnosis. Mindfulness is how we will do it a decade after seeing it in residency.

Practically speaking, mindfulness is the mental checklist we use when assessing patients for both common and uncommon disease. It is a hunch that something is not quite right. Mindfulness will compel you to perform a biopsy or obtain a serum protein electrophoresis. It helps you diagnose nebulous systemic allergic contact dermatitis and biopsy CD30+ T-cell lymphoproliferative disorder masquerading as arthropod bites. Not all clinicians providing dermatologic care will know of such rarities, but we as dermatologists are trained to always consider them as possibilities.

"Great mimickers" like lupus, reviewed extensively in one of this issue's online Boards Fodders, humble us by hiding in plain sight. How does one reconcile the fact that approximately anything that walks into clinic could represent this particularly morbid autoimmune disease? We simply must keep them in mind. Our mindfulness must not end there, however. As dermatologists we can make a broader impact by shifting cultural practices within our healthcare environment. This issue's feature on reducing waste in procedural settings reminds us of how our small actions have limitless potential for good.

Mindfulness and attention to detail are what will elevate us as dermatology residents from good dermatologists to truly great dermatologists. DR

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