A patient first presenting with a red, scaly, itchy foot or leg can prove to be a challenge to diagnose and manage. When faced with a patient with an inflammatory skin condition in the office, the podiatric physician should have a systematic approach to arrive at a baseline differential diagnosis: observe, ask, and apply an algorithm.

**Observe**

Upon entering the treatment room, the practitioner should notice the color, shape, and size in addition to laterality of the lesions on the lower extremity. Primary and secondary lesions (Table 1) should be used to describe the rash appropriately, both in the chart and in correspondence to other physicians. When looking at the shape of the lesions, it is helpful to determine if they were self-induced by the patient (excoriation by a fingernail) or naturally caused (a plantar heel fissure). One should document if the lesions are plantar foot, dorsal foot, or proximal on the lower leg. Nail involvement should be noted. Finally, the fingernails and dorsum and palmar aspects of the hands should be examined as many skin dermatoses mirror the pedal involvement there.

**Objective**

1) To provide a systematic approach to examining and treating inflammatory skin conditions

2) To discuss the most common skin conditions seen in the podiatric practitioner’s office

3) To discuss the first line treatment for inflammatory skin disorders

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**Plaque psoriasis presents as an erythematous plaque with a silvery scale.**
Differentiating...  
**Ask**

Questions that will help form differential diagnoses should be asked while completing the physical exam of the skin. Often, the patient will answer a question that will help direct the diagnosis. Beyond asking the history of present illness, past medical history and family history, the podiatric physician should consider asking if there is a personal or family history of allergic rhinitis, sensitive skin, asthma or skin cancer. The patient should be asked if he has ever seen a dermatologist before and if he has any skin lesions or "rashes" anywhere on the body that may or may not be similar to what is seen on the feet.

Unfortunately, most patients do not correlate what is happening on the rest of the body to what is manifesting on the plantar aspect of the feet. It is the physician’s responsibility to ask the questions in order to make that connection. It is helpful to ask if the skin has ever been biopsied (for example, “did you have a piece of skin removed and then have stitches?”). A skin scraping for KOH that was completed by another physician does not count as a proper biopsy to base the diagnosis on, as a biopsy of inflammatory skin disorders should include the dermis from a pathology perspective.

Other questions to consider asking patients are the color of socks they wear (azo dyes in blue socks can be a potential allergen), occupation, and any associated daily hazards. Also, one should ask about both over-the-counter and homeopathic or natural treatment options they have tried. In order to plan for a possible in-office biopsy during that visit, it is important to ask what the natural progression of the lesions has been and where the newest crops of lesions are.

Now that basic observation and questioning have occurred, it’s important to delve more deeply into the chief complaint and examine the skin fully. Common skin signs of inflammation are calor (heat), rubor (redness), tumor (swelling) and pruritus (itching), which ultimately point to skin barrier dysfunction. The skin barrier, which is stratum corneum with the lipid-enriched extracellular matrix surrounding the corneocytes, is the body’s protective wall and regulates homeostasis, trans-epidermal water loss, and prevents entry of foreign particles and pathogens into the body. Trans-epidermal water loss is the newest target in the dermatological pharmaceutical armamentarium in order to reduce skin flares and comfort the patient with an inflammatory skin dermatosis.

### TABLE 1

**Primary Skin Lesions:**
- Macule
- Patch
- Plaque
- Nodule
- Vesicle
- Bullae
- Wheal
- Telangiectasia

**Secondary Skin Lesions:**
- Ulcer
- Atrophy
- Scale
- Crust
- Erosion
- Excoriation
- Scar
- Lichenification

### TABLE 2

**Algorithm**

<table>
<thead>
<tr>
<th>Plaque</th>
<th>Consider psoriasis, lichen planus, eczema</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>Consider xerosis, tinea pedis, ichthyosis, non-inflamed to mildly inflamed psoriasis and eczema</td>
</tr>
<tr>
<td>Zebra</td>
<td>Blisters? Bullous diabeticorum, pemphigus, drug reaction</td>
</tr>
</tbody>
</table>

**Trans-epidermal water loss is the newest target in the dermatological pharmaceutical armamentarium in order to reduce skin flares and comfort the patient with an inflammatory skin dermatosis.**

### Apply an Algorithm

To begin formulating a differential diagnosis, there is a basic algorithm to follow for treating the most common skin disorders encountered in the office: is it a plaque, scale, or zebra? (Table 2) A well-defined and geometric shaped plaque is often psoriasis, but eczema and lichen planus also must be considered. Circular, serpiginous scales are most often tinea but xerosis should be ruled out. Remember that tinea pedis is KOH positive and may involve both the interspaces and the plantar foot. Any papules, vesicles or other skin markings are considered “zebras” for this algorithm’s purpose.

Following the above algorithm, the most common inflammatory skin conditions the podiatric practitioner will encounter are as follows:

**Plaque**

Plaque psoriasis presents as an erythematous plaque with a silvery scale. These lesions are geographic, bilateral, and symmetrical, and typically occur on the extensor surfaces. The plaques can also be pruritic and affect joints as well as the nails.

Continued on page 177
Differentiating...

Wickham’s striae, which is the fine white lacy overlay on the plaques, may also be seen. This skin condition can be so pruritic that activities of daily living may be compromised. It may also affect the toenails, appearing anywhere from a proximal subungual onychomycosis-like presentation to a thinning of the nail with a ‘wing’ of skin or pterygium pointing distally (Figure 4). Nail involvement should be treated immediately as it can irreversibly scar the nail unit. Lichen planus can also form lesions in the mouth.  

Case Example #1

A young male patient presented to the clinic with a pruritic and scaly plantar rash (Figures 2-3) that was mis-diagnosed as tinea pedis at the emergency department. He had presented there for painful fissures on his feet that prevented him from walking properly. He was given oral ketoconazole at the ED and then presented to the office. A punch biopsy was taken confirming the clinical suspicion of psoriasis, and topical corticosteroid therapy was implemented. The patient healed uneventfully from the acute flare and presents periodically for maintenance treatment. 

If the patient presents with circular papules or plaques with little or no scale that extend proximally from the foot, the differential diagnosis of psoriasis that should be considered is lichen planus. Lichen planus is characteristic of the “P’s”: plentiful, pruritic, purple, polished, popular and planar lesions that are bilateral and symmetrical.

Case Example #2

A young male presented with numerous small plaques and papules that were extremely pruritic (Figure 5). He had been diagnosed with tinea pedis, and had tried over-the-counter antifungals with no improvement. During his office visit, the extent of involvement of the nails and oral cavity were noted and a diagnosis of lichen planus was made.

In addition to psoriasis and lichen planus, a scaly erythematous rash with fissures could also be an eczematous reaction pattern. Defined plaques may or may not be present, but eczema should be a differential diagnosis when considering psoriasis. An eczematous reaction that is often seen is atopic dermatitis. This is usually inherited, as...
patients will present with a personal or family history of asthma, hay fever, and skin rash appropriate for their age. It is often described as an “itch that gets a rash” and can’t be described as having a primary lesion as is the case with psoriasis and lichen planus. Atopic dermatitis, like the other forms of eczema, can be described as having an acute, sub-acute, and chronic stage of the disease. During the acute phase, patients experience intense pruritus with an erythematous scaling and oozing skin rash. Clinically, this can also appear as dry skin eczema, contact dermatitis, stasis dermatitis or even a dermatophyte infection. Subacute forms of atopic dermatitis present with less pruritus, erythema, scaling, and fissured skin rash.

Chronic eczema presents with pruritus, hyper- and hypopigmented plaques of previous inflamed skin, scaly and lichenified skin. Due to the severe skin barrier disruption in all forms of atopic dermatitis, these patients are susceptible to secondary bacterial infections and this should be considered in the treatment plan. Overall, differential diagnosis for atopic dermatitis include: tinea pedis, contact dermatitis, lichen simplex chronicus (chronic form of atopic) and dyshidrotic eczema.

If the patient doesn’t fit into having the “triad” of atopic dermatitis, other types of eczema should be considered. Allergic contact dermatitis can occur when a patient has developed sensitivity to a product (detergent, soap, glue, dye) after using it for a length of time. Allergic contact dermatitis is a result of an antigen-antibody reaction that presents eight to twenty-eight days after initial introduction to the allergen. Contrary to belief, a contact dermatitis can occur on the plantar feet and doesn’t have to be bilateral and symmetrical.

Patch Test
The patch test done in an allergist’s or dermatologist’s office will assist in pin-pointing the allergen causing the reaction. When patients have a history of chronic venous insufficiency with skin that becomes indurated, inflamed, and pruritic, venous stasis dermatitis is the standard diagnosis. Since stasis dermatitis is the most common cause of an id reaction on the palmar aspect of the hand, it is important for the physician to examine the hands to aid in the diagnosis. Lastly, dyshidrotic eczema is a specific condition that should not be an overall term applied to any inflamed skin condition. Contrary to its name, it is not linked to sweat gland dysfunction. Dyshidrotic eczema (pompholyx) characteristically has pruritic tapioca pudding-like blisters on the palmar aspect of the hands with minimal foot involvement. This can be a self-limiting condition; however, most patients have debilitating pain and fissinguring that can be difficult to treat.

Case Example #3
A female patient presented with denuded and inflamed skin on the anterior tibia (Figure 6). She reported that this began after the use of triple antibiotic ointment. Upon further history and examination of the patient, a working diagnosis of allergic contact dermatitis to the preservatives in triple antibiotic ointment was made. The drug was removed from the patient’s regimen, and topical steroids were given. The patient’s inflamed skin resolved in four weeks.

Scale
Xerotic, or dry skin, should have scales present within the skin lines on the plantar foot. Moc-casin tinea pedis, on the other hand, usually presents with small serpiginous scales plantarly. The most common form of dry skin that is KOH negative encountered on the lower extremity is termed astematotic or xerotic eczema. It can also be termed erythema craquele. This is commonly known as “winter itch” due to its increased severity especially during the winter months in the northern part of the United States.

Asteatotic eczema commonly presents on the anterior aspect of the leg as pruritic, annular, scaling patches. This condition is frequently misdiagnosed as tinea corporis, but is

Continued on page 179
Dyshidrotic eczema (pompholyx) characteristically has pruritic tapioca pudding-like blisters on the palmar aspect of the hands with minimal foot involvement.

A diabetic patient who presents with tense blisters that seem to appear overnight, most likely has bullosis diabeticorum. Pemphigus vulgaris is a chronic disease affecting adults which can be life-threatening due to its lesions beginning in the mouth and affecting the oro-pharyngeal area.

Case Example #4
A female patient presented to the clinic for a second opinion. She had been previously diagnosed as having xerosis, but continued to have extreme pruritus that was not controlled by any topical medication. Her plantar feet had a localized plaque with scale in the medial arch with no underlying erythema (Figure 8). A biopsy helped to diagnose her with psoriasis and the appropriate therapy commenced.

Zebra
If vesicles, bulla, or other skin lesions are present, the podiatric physician should consider several other diagnoses. A diabetic patient who presents with tense blisters that seem to appear overnight, most likely has bullosis diabeticorum. Bullosis diabeticorum may have little inflammation present and may heal uneventfully if the patient doesn’t pop or scratch them. Bullous pemphigoid, commonly seen in older adults in nursing homes, will present with subepidermal blisters that originally were urticarial plaques that turned into tense bullae. These lesions are located wide spread throughout the body on flexural surfaces. Nikolsky’s sign, or exfoliation of the upper layers of epidermis upon rubbing of the skin, is negative and these lesions can crust, pigment, but not scar unless excoriated into an ulcer. Pemphigus vulgaris is a chronic disease affecting adults which can be life-threatening due to its lesions beginning in the mouth and affecting the oro-pharyngeal area. These are tender lesions and are usually Nikolsky’s sign positive.

If patients have target lesions with three zones of color (center lesion surrounded by a clear zone, and followed by a red border) associated with circular papules and/or plaques with mild scaling; one must consider erythema multiforme minor. This is associated after a manifestation of herpes simplex (recent cold sore or genital lesion) and the target lesions may present on the feet. Drug reactions may also present as target-like lesions with less defined target zones of color on the lower extremity.

First-Line Treatment Options
When treating a condition that is fungal, bacterial, or inflammatory in nature, the podiatric practitioner should use the appropriate drug, but if one is unsure of the cause, a biopsy of the skin lesion should be completed. Inflammatory skin conditions often warrant topical corticosteroid therapy as a first line method in treatment.

It is useful to avoid combination steroid-antifungal drugs or methylprednisolone dose packs as these may create a quick fix, but ultimately can cause frustration for the dermatological patient. The rebound effect from the dose pack can be potentially debilitating by causing a dermatitis that is worse than the original reaction, and the dose pack itself isn’t the same as prescribing a true prednisone taper.

When in doubt, the first line therapy for an inflammatory skin dermatosis should be a topical steroid and a skin moisturizer or keratolytic (such as urea or lactic acid).
Differentiating...

The stage (acute, sub-acute, and chronic) of the skin disorder and the length of time the condition presents will aid in the level of topical steroid which should be used.

For the severe, acute inflammatory skin concerns, Class 1 drugs should be used for two weeks consecutively. Some examples of Class 1 steroids include: clobetasol (Clobex, Olux, Temovate), betamethasone (Diprolene), diflorasone (Psorcon), halobetasol (Ultravate), fluocinonide (Vanos).

In the author’s experience, no refills are given due to the side-effects of using a Class 1 steroid for longer than fourteen days. Side-effects include skin thinning or atrophy which can lead to stretch marks, telangiectasias, and hypopigmentation, to name a few. It is helpful to titrate down from a Class 1 steroid to a mid-potency preparation after that initial two week period.

For example, one could have the patient use a Class 1 steroid on Monday, Wednesday, and Friday with the mid-potency topical steroid for the days in between.

The fairly new skin barrier protection emollient moisturizers (Impruv lotion, Mimyx, Atopiclair) should be added to decrease transepidermal water loss and decrease flares. If the patient is in the sub-acute or chronic stage and a topical steroid is warranted for the level of irritation and pruritus present, the practitioner should prescribe the appropriate steroid class (Table 3).

The goal in treating inflammatory conditions is to ultimately have the patient use little to no topical steroid, and use the previously mentioned skin moisturizers as maintenance, if possible. If the patient does not respond to the topical steroid as predicted, further consideration of other diagnoses should be given and a biopsy should be planned. If this is not within the comfort zone of the practitioner, he should then refer the patient for a dermatology consult.

Overall, inflammatory skin dermatoses can be challenging and frustrating for both the practitioner and patient. By doing a thorough history and skin exam, the astute practitioner can create a working list of differential diagnoses that can be further changed by both reaction to treatment and, of course, a biopsy result.

TABLE 3
Topical Steroid Classes

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I: Ultra potent</td>
<td></td>
</tr>
<tr>
<td>Class II: Potent</td>
<td></td>
</tr>
<tr>
<td>Class III: Upper mid-strength</td>
<td></td>
</tr>
<tr>
<td>Class IV: Mid-strength</td>
<td></td>
</tr>
<tr>
<td>Class V: Lower-mid strength</td>
<td></td>
</tr>
<tr>
<td>Class VI: Mild</td>
<td></td>
</tr>
<tr>
<td>Class VII: Least potent (hydrocortisone)</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from the National Psoriasis Foundation Topical Steroids Potency Chart

References


When in doubt, the first line therapy for an inflammatory skin dermatosis should be a topical steroid and a skin moisturizer or keratolytic (such as urea or lactic acid).

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Ms. Oliver is a fourth year student at Temple University School of Podiatric Medicine, Philadelphia, PA.

Continuing Medical Education

Dr. Vlahovic is an Associate Professor at Temple University School of Podiatric Medicine.

Ms. Oliver is a fourth year student at Temple University School of Podiatric Medicine, Philadelphia, PA.
1) All of the following are primary lesions EXCEPT:
   A) macule
   B) bulla
   C) tumor
   D) scale

2) In plaque psoriasis, which of the following best describes the lesion?
   A) plaque with silver scale
   B) plaque with yellow scale
   C) plaque with pustules
   D) plaque with peeling inside edge

3) The pustules in palmar/plantar psoriasis are filled with:
   A) sterile fluid
   B) staph aureus
   C) pseudomonas
   D) strep

4) Lichen planus can be described by all of the following EXCEPT:
   A) Peachy
   B) Pruritic
   C) Purple
   D) Papular

5) The best differential diagnosis for plantar psoriasis is:
   A) atopic dermatitis
   B) herpes simplex
   C) erythema multiforme
   D) neurotic excoriations

6) The most common cause of an ID reaction is:
   A) Atopic dermatitis (eczema)
   B) Irritant contact dermatitis
   C) Stasis dermatitis
   D) Lichen simplex chronicus

7) Which of the following doesn’t the patient need to have to diagnose of atopic dermatitis (eczema)?
   A) paronychia of great toe
   B) personal history of asthma, runny nose, skin rash
   C) pruritis
   D) chronic relapsing course

8) Asteatotic Eczema (Eczema craquele) is associated with:
   A) children
   B) high humidity
   C) frequent bathing
   D) hyperhidrosis

9) Bullosa diabeticorum (diabetic bullae) usually appear as ___ blisters on the lower extremity.
   A) tense
   B) flaccid
   C) pus-filled
   D) hemorrhagic

10) Pemphigus vulgaris lesions most commonly begin in this location:
    A) Pretibial
    B) Soles
    C) Thighs
    D) Mouth

11) Which of the following is a Class 1 steroid?:
    A) Psorcon (diflorasone)
    B) Cortaid (hydrocortisone)
    C) Aclovate (aclometasone)
    D) Kenalog (triamcinolone)

12) Contact dermatitis:
    A) is bilateral and symmetrical
    B) intensity varies on each limb
    C) only involves vesicles
    D) never itches

13) Dyshidrotic eczema (pompholyx):
    A) is linked to sweat glands
    B) occurs mostly on the hands
    C) first appears as pustules
    D) is a drug reaction

14) One of the side-effects of using a Class 1 topical steroid consecutively over the initial two-week period is:
    A) lichenification
    B) scar formation
    C) atrophy
    D) hyperkeratosis

15) Which of the following is a secondary skin lesion?
    A) telangiectasia
    B) scale
    C) papule
    D) patch

Continued on page 182
16) The new skin barrier moisturizers help to reduce flare by:
   A) decreasing trans-epidermal water loss
   B) increasing trans-epidermal water loss
   C) decreasing T-cell lymphocyte involvement
   D) increasing T-cell lymphocyte involvement

17) The target lesion in erythema multiforme minor has __ zone(s) of color:
   A) 1
   B) 2
   C) 3
   D) 4

18) A differential diagnosis for tinea pedis would be:
   A) pityriasis rosea
   B) erythema multiforme minor
   C) nevi
   D) stretch mark

19) Dyshidrotic eczema has vesicles that can be described as:
   A) grapefruit-like
   B) tapioca-like
   C) peau d’orange-like
   D) raspberry-like

20) The latest treatment for inflammatory skin dermatoses involves prescribing:
   A) a topical steroid and a moisturizer
   B) a topical steroid and an NSAID
   C) a topical steroid and sunscreen
   D) a topical steroid and diphenhydramine

See answer sheet on page 183.
**Enrollment/Testing Information and Answer Sheet**

**Note:** If you are mailing your answer sheet, you must complete all info. on the front and back of this page and mail with your credit card information to: **Podiatry Management, P.O. Box 490, East Islip, NY 11730.**

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(4) Complete all other information on the front and back of this page.

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City __________________________ State __________ Zip ______________

Charge to: _____ Visa _____ MasterCard _____ American Express

Card # ________________________ Exp. Date ______________

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State License(s) __________________ Is this a new address? Yes ________ No ______

Check one: ______ I am currently enrolled. (If faxing or phoning in your answer form please note that $2.50 will be charged to your credit card.)

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Over, please
ENROLLMENT FORM & ANSWER SHEET (cont’d)

EXAM #4/10
Differentiating Dermatological Diagnosis and Treatment (Vlahovic and Oliver)

Circle:
1. A B C D
2. A B C D
3. A B C D
4. A B C D
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10. A B C D

11. A B C D
12. A B C D
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14. A B C D
15. A B C D
16. A B C D
17. A B C D
18. A B C D
19. A B C D
20. A B C D

LESSON EVALUATION

Please indicate the date you completed this exam
____________________________

How much time did it take you to complete the lesson?
______ hours ______ minutes

How well did this lesson achieve its educational objectives?
______ Very well _________ Well
______ Somewhat _________ Not at all

What overall grade would you assign this lesson?
A B C D

Degree____________________________

Additional comments and suggestions for future exams:
________________________________________________
________________________________________________
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