Take Control of Hand Dermatitis
Follow these tips on history, exam, and testing in order to make the right diagnosis and institute effective therapy.

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Chronic hand dermatitis often interferes with ability to work and to perform activities of daily living. Affected patients frequently report frustration with previous therapeutic interventions. Often non-response is related to inappropriate therapeutic selection for the presenting diagnosis and/or failure to identify other causative factors that patients should avoid in order to maintain clearance. Precise diagnostic classification can lead to effective treatment and in some cases complete cure. The following recommendations will help guide the patient exam and treatment selection in order to yield optimal therapeutic outcomes.

Diagnostic Clues From the History
Dermatologists know that an accurate patient history is critical to accurate diagnosis in a range of dermatoses. In chronic hand dermatitis, effective and specific questioning provides important clues about the cause and progression of the presentation.

Initial questions. Establish other affected areas of skin and duration of symptoms. Ask where the dermatitis first began by having the patient point to the site. Pattern of distribution is often a clue to the cause of allergic contact dermatitis. For example, adult onset and duration of months to a few years suggests allergic contact dermatitis and should direct the history to the items listed under “Contact dermatitis history.”

Patients with a history of dermatitis of both the hands and feet for decades or since childhood are much less likely to have contact dermatitis, as the environment of the hands and feet is unlikely to include the same contactants over many years. Evaluation of such a patient would focus on differentiating atopic from dyshidrotic dermatitis.

Ask about itch as this is nearly always present in allergic contact dermatitis but variable in other types of hand dermatitis.

Inquire about seasonal variation and frequency of handwashing. Irritant hand dermatitis is more common in patients with frequent water contact in low humidity conditions such as northern or Midwest winters. Irritant hand dermatitis is very common in the general population but surprisingly uncommon in a hand dermatitis referral clinic. This is likely because patients can self-diagnose irritant hand dermatitis.

Taking the Contact Dermatitis History
When clinical clues and patient responses suggest contact dermatitis, direct history-taking toward uncovering possible sensitizers through direct questioning and education.

Explain Why You Ask. Patient education begins with taking the history. Patients generally conceptualize allergy as an immediate reaction that resolves within hours. Therefore, even with direct questioning, patients will often not report occasional exposures that do not cause immediate symptoms. Patients also do not recognize the possibility of secondary allergic contact dermatitis to medicaments or protective gloves used to treat the original hand dermatitis, and will not report contactants started after the symptoms began on the assumption that these could not be causative. Explain to the patient before taking the initial history that reports of even occasional or only recent exposures may be important.

What to Ask. Begin by asking about cleansers, emollients, and topical medicaments used on the hands, including brand name and vehicle. Ask about all types of gloves used at work, at home, and for hobbies. Based on the patient’s occupation and hobbies, ask about contact with known sensitizers specific to the history. The physician must have extensive knowledge of likely sensitizers in order to obtain this focused history. This is critical to further evaluation as the history may direct allergens chosen for subsequent patch testing.

Clues from the History
Diagnosing dyshidrotic eczema. A history of initially itchy tiny blisters of the lateral fingers and palms and/or the soles and toes is suggestive. Most patients have a history of immediate type hypersensitivity to pollens, animal dander, or foods that is rarely directly causative. History should be directed toward the potential causes listed below.

Protein contact hypersensitivity. Inquire about symptom flare.
the day after handling uncooked foods, as protein contact dermatitis is an avoidable cause of similar symptoms.2

Nickel hypersensitivity. Nickel allergy can cause dyshidrosiform systemic contact dermatitis.3 History of jewelry intolerance is a sensitive but not perfect indicator of nickel allergy. The standard nickel sulfate 2.5% in petrolatum patch test is also not entirely sensitive, but higher concentrations are not routinely used as they may cause false positive irritant reactions.4 Occasional patients with negative nickel patch tests will demonstrate a dyshidrosiform flare with ingestion of nickel.5

Tinea pedis. Patients with dyshidrotic eczema are more likely than controls to have dermatophytosis of the feet, which may cause dyshidrotic symptoms on the hands in the absence of infection at that site.6 Inquire about a history of athlete’s foot or fungal toenail infections in the patient or family.

Directed History for Psoriasiform Dermatitis
Chronic hand dermatitis may at times be difficult to differentiate from palmar plantar psoriasis. Family history, history of involvement of extensor sites typical of psoriasis, and history of morning arthralgias consistent with psoriatic arthritis may all suggest the diagnosis of psoriasis.

Smoking history is highly relevant to palmar plantar pustulosis, which occurs almost exclusively in smokers.7 Smokers are also less likely to respond to treatment with hand/foot PUVA.8

Diagnostic Clues from the Examination
Led by a meaningful patient history, the exam will provide further diagnostic clues that suggest the underlying etiology. Pay attention to morphology and distribution, focusing not only on the hands but also on the feet and other relevant body sites as indicated.

Morphology
Vesicles. Predominance of vesicles may occur in acute hand dermatitis but in a patient with a history of chronic hand dermatitis suggests dyshidrotic eczema or protein contact dermatitis. Scabies also occasionally presents as primarily hand dermatitis with vesicles in the interdigital areas and volar fold of the wrist.

Sharp dermarcation of scaly plaques. This pattern is suggestive of psoriasis, especially if bilaterally symmetrical. Allergic contact dermatitis to an item gripped in the palm such as handles on a treadmill or portions of a glove may also present in this pattern. Tinea must also be ruled out with this presentation.

Pustules. Pustules on the palmar surface suggest psoriasis or palmar plantar pustulosis. On the dorsal hand, they may occur with any type of dermatitis that is secondarily infected.

Milia. Rarely, milia will be noted on the dorsal hands and suggest a bullous disorder with an atypical presentation mimicking hand dermatitis. Examples include porphyria cutanea tarda and epidermolysis bullosa acquisita.

Distribution
Interdigital webs as predominant area of involvement. This pattern suggests a liquid contactant as a cause (See photo 1). Irritant contact dermatitis to soap and water in low humidity
conditions often presents in this pattern, but allergic contact dermatitis to anti-bacterial ingredients such as chloroxylenol or preservatives in liquid soaps may have an identical clinical presentation.

**Hand with face or eyelid dermatitis.** This pattern is highly suggestive of allergic contact dermatitis, particularly to a sticky substance such as nail polish or acrylates in adhesives or plant resins, such as colophony. Allergic contact dermatitis to ointments in medicaments also often presents with this pattern.

**Hand with foot involvement.** Especially if present for years or more, this is likely to represent dyshidrotic or atopic dermatitis or palmoplantar psoriasis. However, if recent in onset and especially in an adult, this pattern may be due to allergic contact dermatitis to shoe and glove components or to topical medicaments applied to the feet with the hands.

**Non-dominant fingertips only.** Dermatitis of the non-dominant index finger and thumb is classic for allergy to an item that is held with this hand while being cut with the dominant hand. Photo 2 shows the non-dominant hand of a patient allergic to diallyl disulfide in onion and garlic.

Pantomime is very useful to assist understanding of the way a patient performs a task that involves handling a sensitizer. Encourage pantomime during the history and examination. It can greatly improve understanding of the distribution of dermatitis.

**Testing**

**Allergic Contact Dermatitis Suspected.** Patch testing is necessary to confirm or rule out allergic contact dermatitis. Hand dermatitis is often due to occupational contactants that are not adequately screened with the commercial patch test series currently available in the US. Therefore, patch testing for hand dermatitis is most sensitive if performed by a dermatologist with special interest in patch testing who is likely to have specialized patch test series available. Examples of occupation-specific patch test series include dental (e.g. glutaraldehyde), oil and coolants (e.g. biocides), hairdresser (e.g. thioglycolate, ammonium persulfate), photographic chemical (e.g. dyes), and printer series (e.g. acrylates).

Topical medicaments are another frequent cause of hand dermatitis. Bacitracin and corticosteroids are also not included on the commercial patch test series currently available in the US. Therefore, always use an extended standard series for testing patients with hand dermatitis.

When latex glove allergy is suspected, order serologic testing for latex specific IgE. Since this test is not entirely sensitive, consider provocative testing with a finger cot cut from a glove. Because latex may causes an anaphylactic reaction, perform provocative testing only in settings equipped to handle such a response.

**Dyshidrotic Eczema Suspected.** Evaluation of the feet with potassium hydroxide preparation and/or culture of scrapings from scaly areas or toenails is indicated. Also evaluate scaling of the hands with these methods to rule out true dermatophyte infection, which may present on both feet and one hand. Consider patch testing to 5% nickel sulfate in petrolatum in patients with a history of metal intolerance if the standard 2.5% nickel sulfate patch test is negative and if a positive result would change clinical management in terms of dietary restriction of nickel.

**Other Diagnoses Suspected.** When clinical features are suggestive of both eczema and psoriasis, skin biopsy often shows features of both and is therefore often non-diagnostic as well.

When vesicles are present, skin biopsy with direct immunofluoresence may be useful to rule out an atypical dyshidrosiform presentation of a bullous disorder (See photo 3).

**Treatment: General Recommendations**

**Emollients.** Barrier dysfunction leads to stimulation of the innate immune system, which is a feature of all types of hand dermatitis and psoriasis. Therefore, all hand dermatitis patients benefit from use of emollients to maintain hydration of the stratum corneum. Patients should apply emollients to damp hands immediately after each handwashing. Ointment or cream formulations are more effective than lotions. Patients may prevent repeated wet/dry cycles by using occlusive gloves for all wet work. To prevent perspiration from wetting and irritating the hands, cotton gloves should always be worn under the occlusive gloves.

**Antibiotics and Antimicrobials.** Chronically inflamed skin is susceptible to secondary infection. This is particularly true of atopic patients who do not express sufficient anti-microbial peptides to fight staphylococcus aureus. Antibiotics are often
helpful in chronic hand dermatitis. Because re-infection is common, and staphylococci frequently become resistant, solutions of sodium hypochlorite (bleach) may be used as a hand soak; under patch test occlusion, concentrations up to 1% are not irritating. Daily diluted bleach soaks may be recommended as long-term prophylaxis during and after systemic antibiotic therapy. This regimen has been demonstrated to be effective in dermatitis in cattle.

Treatment: Disease-Specific Recommendations

Irritant Contact Dermatitis. When frequent disinfection of hands is required, such as in health care workers, an alcohol-based hand sanitizer may be used to replace some hand washings without increasing irritancy, but these cleansers may not kill the spores of Clostridium difficile which is currently epidemic in many hospitals.

Corticosteroids do not improve experimental irritant contact dermatitis or irritant patch test responses. Avoid long-term use of topical corticosteroids in chronic irritant hand dermatitis as the side effect of atrophy may actually lower the irritant threshold and worsen the problem.

Allergic Contact Dermatitis. Complete and consistent avoidance is curative but often requires significant patient education. Computer-generated lists of personal care products and gloves free of identified allergens are available to members of the American Contact Dermatitis Society via their website (www.contactderm.org).

Some allergens, such as glutaraldehyde, epoxy resin, and acrylicates, penetrate most gloves. Plastic laminate gloves (e.g. Silvershield, 4H) block most allergens, but are loose fitting and may interfere with dexterity. Wearing a tighter fitting vinyl or rubber glove atop the plastic laminate glove may help to solve this problem.

Dyshidrotic Eczema. Nickel sensitive patients should undergo a three-week trial of a low nickel diet. Fisher's textbook provides detailed dietary instructions (provided by Niels Veien in Fisher's Contact Dermatitis ed by Rietschel and Fowler, 5th edition, Lippincott, Williams, and Wilkins. Philadelphia 2001 pages 728-729). Because the diet is difficult to follow, oral chelation with tetraethylthiuramdisulfide is occasionally attempted.

Treat tinea pedis, if present. Although most patients with dyshidrotic eczema have multiple type 1 hypersensitivities, symptoms of dermatitis are always localized to the hands and feet. This suggests that unique skin anatomy allows expression in these areas. The palms and soles are richly innervated. Botulinum toxin, which inhibits release of autonomic neurotransmitters, may inhibit release of substance P and improved dyshidrotic eczema in a study using the untreated contralateral hand as control.

Psoriasis and palmoplantar pustulosis. Topical retinoids, such as tazarotene, or systemic retinoids, such as acitretin, are often effective for psoriasis. The biologic drugs currently approved for psoriasis, such as etanercept, are also effective. Encourage smoking cessation. Hand/foot soak PUVA is often effective for psoriasis as well as all of the types of hand dermatitis.

Severe, recalcitrant hand dermatitis. After less toxic therapeutic options have been exhausted, systemic immunosuppressive therapies may be needed. Methotrexate is FDA-approved for psoriasis. Methotrexate decreases CLA expression on T-cells, thereby decreasing homing to skin, and is effective in atopic and dyshidrotic eczema, as well. Risk factors for persistent hand eczema (defined as present greater than 50 percent of the time for greater than 15 years) include onset before age 20 years, a history of childhood flexural dermatitis, and moderate to severe disease at presentation. Because of the expected chronicity, steroid-sparing agents should be used instead of monotherapy with systemic steroids for severe chronic hand dermatitis.

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