Phytophotodermatitis (PPD) is a nonallergic contact dermatitis and thus is independent of the immune system, so prior sensitization is not required. It sometimes is known by colorful names such as margarita photodermatitis, in which a slice of lime in a refreshing summer drink may be etiologic, or berloque dermatitis, caused by exposure to perfumes containing bergapten (5-methoxypsoralen). Phytophotodermatitis may develop when phototoxic agents such as furocoumarins, which protect plants from fungal pathogens, and psoralsens are applied to the skin followed by exposure to UV light, more specifically in the UVA range of 320 to 400 nm. Thus, these chemicals produce a phototoxic rather than photoallergic reaction, leading to cellular damage. Furocoumarins and psoralsens often are found in plants such as celery and figs as well as in citrus fruits such as limes, lemons, and grapefruits. Exposure may be cryptic, as the patient may not consider or mention the eruption as possibly caused by activities such as soaking one’s feet in a folk remedy containing fig leaves. Once these phototoxic agents come in contact with the skin, the symptoms of PPD may arise within 24 hours of exposure, beginning as an acute dermatitis with erythema, edema, vesicles, or bullae accompanied by pain and itching.

Etiology
Phytophotodermatitis is caused by exposure to several different types of plants, including Ficus carica (common fig), the genus Citrus (eg, lime, lemon), or Pastina sativa (wild parsnip). Each of these contain furocoumarins and psoralsens—phototoxic agents that cause cellular damage with epidermal necrosis and resultant pain when the skin is exposed to UVA light. There are 2 types of photochemical reactions in PPD: type I reactions occur in the absence of oxygen, whereas oxygen is present in type II reactions. Both damage cell membranes and DNA, which then results in DNA interstrand cross-linking between the psoralen furan ring and the thymine or cytosine of DNA, activating arachidonic acid metabolic pathways to produce cell death.
Epidemiology
The incidence of PPD is unknown due to the high variability of reactions in individuals spanning from children to the elderly. It can be caused by many different wild and domestic plants in many areas of the world and can affect any individual regardless of age, race, gender, or ethnicity. Some individuals may be affected by hyperpigmentation without prominent inflammation. Diagnosis of PPD can be challenging, and an occupation and recreational history of exposure or recent travel with possible contact with plants may be required.

Occupational Dermatitis
Phytophotodermatitis also may be an occupational disease. Occupational exposure may occur in soldiers during military drills and other activities, farm workers, chefs, gardeners, groundskeepers, food processors, bartenders, and florists. Wearing protective gloves when handling plants such as limes, lemons, grapefruit, celery, or parsnips may prevent occupational exposure. Exposure to hogweed, an invasive species originally introduced as an ornamental plant in Europe and the United States, can produce a dramatic acute occupational exposure. "Hogweed phytodermatitis" is associated with adjacent cutaneous edema near the reaction site or along with the erythema and blister formation. Its severity is related to the intensity of sun exposure and amount of furocoumarins. The most common etiologic plants are citrus fruits such as limes and lemons, but it also can be caused by celery, figs, parsley, parsnips, and even mustard. Wild parsley may grow in grass, producing a bizarre pattern on the back in children who lay in the grass and then spend time in the sun. Phytophotodermatitis usually is followed by postinflammatory hyperpigmentation, which may be the principal or only finding in some individuals.

Recreational Dermatitis
Phytophotodermatitis may be caused by exposure to phototoxic agents during leisure activities. Recreational exposure can occur almost anywhere, including in the kitchen, backyard, park, or woods, as well as at the beach. One notable culprit in recreational PPD is cooking with limes, parsley, or parsnips—plants that often are employed as garnishes in dishes, allowing early exposure of juices on the hands. Individuals who garden recreationally should be aware of ornamental plants such as hogweed and figs, which are notorious for causing PPD. Children's camp counselors should have knowledge of PPD, as children have considerable curiosity and may touch or play with attractive plants such as hogweed. Children enjoying sports in parks can accidentally fall onto or be exposed to wild parsnip or hogweed growing nearby and wake up the next day with erythema and burning. Photoprotection is important, but sunscreens containing carrot extract can produce PPD. Widespread PPD over 80% of the body surface area due to sunbathing after applying fig leaf tea as a tanning agent has been described. Eating figs does not cause photosensitization unless the juice is smeared onto the skin. Margarita dermatitis and "Mexican beer dermatitis" can occur due to limes and other citrus fruits being used as ingredients in summer drinks. Similarly, preparing sangria may produce PPD from lime and lemon juices. In one report, hiking in Corsica resulted in PPD following incidental contact with the endemic plant Peucedanum paniculatum.

Perfume (Berloque) Dermatitis
Perfume dermatitis, or berloque dermatitis, is a type of PPD for which the name is derived from the German word berlock or the French word berloque meaning trinket or charm; it was first described in 1925 by Rosenthal. Many perfumes contain bergamot oil, but the incidence of this condition has been diminished due to use of artificial bergamot oil.

Clinical Manifestation
Phytophotodermatitis is first evident as erythematous patches that appear within 24 hours of initial exposure to a phototoxic agent and UVA light, sometimes with a burning sensation. Solar exposure within 48 hours of sufficient plant exposure is required. Perfuse sweating may enhance the reaction. Rarely, it first may be seen with the sudden appearance of asymptomatic hyperpigmentation. One may see the pattern of splash marks from lime or lemon juice (Figure 1). The acute dermatitis may be associated with adjacent cutaneous edema near the reaction site or along with the erythema and blister formation. Its severity is related to the intensity of sun exposure and amount of furocoumarins. The most common etiologic plants are citrus fruits such as limes and lemons, but it also can be caused by celery, figs, parsley, parsnips, and even mustard. Wild parsley may grow in grass, producing a bizarre pattern on the back in children who lay in the grass and then spend time in the sun. Phytophotodermatitis usually is followed by postinflammatory hyperpigmentation, which may be the principal or only finding in some individuals.

Differential Diagnosis
Phytophotodermatitis may resemble other types of dermatitis, particularly other forms of contact dermatitis such as poison ivy, and occasionally other environmental simulants such as jellyfish stings. Photosensitizing disor-
exposed to the skin in sites of airborne contact.20 Excessive solar exposure is popular, particularly among adolescents, so sunburn and sunburn-like reactions can be noteworthy.25,26

Treatment

Phytophotodermatitis can be treated with topical steroids, sometimes adding an oral antihistamine, and occasionally oral steroids.2-4 Localized pain or a burning sensation should respond to therapy. Alternatively, a cold compress applied to the skin can relieve the pain and pruritus, and the burn can be debrided and dressed daily with silver sulfadiazine plus an oral nonsteroidal anti-inflammatory drug. This eruption should be self-limited as long as it is recognized early and the cause avoided. Management of acute exposure includes prompt application of soap and water and avoidance of UV light exposure for 48 to 72 hours to prevent psoralen photoactivation.

Because PPD is essentially a chemical burn, a burn protocol and possible referral to a burn center may be needed, whether the reaction is acute or widespread.11,12,14,27,28 Surgical debridement and skin grafting rarely may be mandated.14 Postinflammatory hyperpigmentation may ensue as the dermatitis resolves but is not common.

The best approach for PPD is prevention (Figure 2). Individuals who are at risk should be aware of their surroundings and potential plants of concern and employ personal protective equipment to shield the skin from plant sap, which should be promptly removed if it comes in contact with the skin.

REFERENCES