

## Wilderness Medicine Case Study

She may be having a photoallergic reaction or a polymorphous light eruption (PMLE).

### PMLE

Polymorphous light eruptions caused by sun exposure in people who have developed a sensitivity to sunlight and cause an itchy rash. The rash usually appears as red, tiny bumps or slightly raised patches of skin in sun-exposed areas. PMLE typically occurs during spring and early summer when a person's exposure to sunlight increases. Repeat episodes are less likely as the summer progresses, but often recur each year after the first incident. Women are more likely to develop the disorder with the first episode appearing during the teenage years or 20s. People with fair skin or those living in northern regions are more likely to develop the disorder. Most eruptions resolve on their own within one or two weeks. An OTC cream containing at least 1 percent hydrocortisone may help reduce the itching, as may oral antihistamines (e.g.: Benadryl) and ibuprofen or naproxen may reduce the inflammation. In addition, protect all exposed skin from UV radiation using a high SPF sunblock and clothing.

### Photoallergic Reactions

In photoallergic reactions, incoming light activates a compound—usually a drug—that binds with skin proteins to create an allergen. The immune system initiates a cellular response that produces cytotoxic (killer) T-cells which in turn destroy healthy skin cells. The subsequent inflammation causes an itchy, bumpy, dermatitis that may include the formation of small, clear blisters. The rash typically appears in both sun-exposed and sun-protected areas of the body. Because it is an allergic response, prior exposure is required.

While phototoxic, photoallergic, and PMLE reactions may be difficult to tell apart, in most cases photoallergic reactions produce a bumpy itchy dermatitis while phototoxic reactions appear as a severe sunburn. The rash from PMLE tends to appear in sun-exposed areas while the rash from a photoallergic reaction tends to appear in both sun-exposed and sun-protected areas.

### Distinguishing between Phototoxic & Photoallergic Reactions

Distinguishing Feature		Phototoxic	Photoallergic
Frequency of occurrence		High	Low
Amount of agent required to elicit a reaction		Large	Small
Onset of S/Sx after exposure		Minutes to hours	24-72 hours
Multiple exposure to agent required to elicit a reaction		No	Yes
Distribution		Sun-exposed areas only	Sun-exposed areas; severe reactions may spread to include unexposed areas
Clinical characteristics		Exaggerated sunburn	Dermatitis
Immunologically mediated		No	Yes
Signs & Symptoms	Blisters	Severe reactions only	Severe reactions only
	Redness & Swelling	Yes	Yes
	Pigmentation changes	Possible	No
	Separation of nail bed	Possible	No
	Itching	Uncommon	Yes

## Common Photosensitizing Drugs encountered in the Outdoors

Drug Class	Drug	Phototoxic	Photoallergic	Other
Antibiotics	Tetracyclines (doxycycline, tetracycline)	Yes	No	Yes
	Fluoroquinolones (dprofloxacin, ofloxacin, levofloxacin)	Yes	No	No
	Sulfonamides (TMP/SMX)	Yes	No	No
NSAID	Ibuprofen	Yes	No	Yes
	Ketoprofen	Yes	Yes	No
	Naproxen	Yes	No	Yes
	Celecoxib	No	Yes	Yes
Antifungals	Terbinafine	No	No	Yes
	Itraconazol	Yes	Yes	No
	Voriconazole	Yes	No	Yes
Sun Screens	Para-aminobenzoic Acid (PABA)	Yes	Yes	No
	Cinnamates	No	Yes	No
	Benzophenones	No	Yes	No
	Salicylates	No	Yes	No
Fragrances	Musk Ambrette	No	Yes	No
	6-Methylcoumarin	No	Yes	No
Oral Contraceptives	All Estrogen-Progestin combinations	No	Yes	Yes
Diuretics	Acetazolamide	Yes	No	No

To treat a photoallergic reaction, attempt to identify and discontinue the sensitizing agent. Resolution is variable once the offending agent is removed and depends solely upon the chemical composition of the compound. Cool compresses may offer relief from most S/Sx; oral benedryl may help.

Given your teenager's complexion, where she lives, and that her rash is present in only sun exposed areas, to the extent that it is possible treat for both PMLE and a photoallergic reaction. Since cinnamates, benzophenones, and salicylates appear in most commercial sunscreens and may cause a photoallergic reaction discontinue the use of her sunscreen and substitute a zinc oxide sunblock. Since oral contraceptives containing estrogen-progestin combinations may also trigger a photoallergic reaction, discontinue those as well. Administer ibuprofen and Benedryl. With a bit of luck your treatment will help control the rash and allow her to enjoy the remainder of her trip.