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Adult Photosensitivity Disorders

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The authors report no conflict of interest.

Table 1.
Adult Photosensitivity Disorders

Disease	Pathophysiology	Clinical Features	Management/Prognosis	Other/Pearls
Exogenously Induced Photosensitivity				
Photoallergic reactions	Immunologic; delayed-type hypersensitivity to a photoallergen ^a in previously sensitized patients	Delayed onset (24–72 h); pruritic eczematous eruption on sun-exposed sites; presentation and pathology resembles allergic contact dermatitis	Photopatch testing to identify trigger; photoprotection (UVA + UVB); analgesics and topical or oral steroids	Must differentiate from airborne contact dermatitis
Phototoxic reactions	Nonimmunologic; direct cellular injury from UVR-induced activation of a phototoxic agent ^b ; UVA; does not require prior sensitization	Acute onset (minutes to hours); sunburnlike reaction; erythema +/- blistering; hyperpigmentation; photo-onycholysis	Identification and avoidance of offending agent; photoprotection (UVA + UVB); analgesics and cool compresses, topical emollients, topical analgesics	Phytophotodermatitis variant: furocoumarins (eg, limes, celery); UVR-induced recall variant: methotrexate
Immune-Mediated Photosensitivity				
Chronic actinic dermatitis	Contact allergy–like delayed-type hypersensitivity to photoinduced endogenous cutaneous antigen; UVA, +/- UVB +/- visible light +/- preceding topical/oral photosensitizer (eg, <i>Compositae</i> , sunscreens)	Middle-aged to elderly men with chronic sun exposure; edematous, scaly, lichenified, eczematous papules/confluent plaques on exposed sites	Photopatch testing commonly positive; phototest positive to: UVA, UVB, UVA + UVB, UVB + UVA + VL; reduction of MED to both UVA + UVB; broad-spectrum photoprotection; low-dose PUVA; topical tacrolimus; topical and systemic steroids; cyclosporine; azathioprine; hydroxyurea; thalidomide	Must differentiate from cutaneous T-cell lymphoma; actinic reticuloid variant: severe clinical variant, has features of pseudolymphoma and may precede noncutaneous T-cell lymphoma

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Table 1. (continued)

Disease	Pathophysiology	Clinical Features	Management/Prognosis	Other/Pearls
PMLE	Unknown, may be a type IV delayed-type hypersensitivity to possible photoinduced endogenous cutaneous antigen (heat shock protein); broadband UVB, UVA, +/- visible radiation	Nonscarring, pruritic, erythematopapular eruption (most common) on symmetric areas exposed to sun; can appear minutes to up to 4 d after exposure; most severe in spring and early summer; hardening after repeated exposure	Phototesting usually reveals a normal MED + elicits lesions with both UVA +/- UVB irradiation; photoprotection (UVA coverage important); prophylactic narrowband UVB or PUVA phototherapy; topical steroids; prednisone; azathioprine; cyclosporine	Histopathology: papillary dermal edema, superficial and deep perivascular lymphohistiocytic dermal infiltrate; various presentations: juvenile spring eruption with papulovesicles on helices seen in primarily male adolescents; darkly pigmented patients; grouped pinpoint papules
Solar urticaria	IgE-mediated response to photoinduced endogenous cutaneous antigen; UVA +/- visible light	Most common in young adult females; appears seconds to minutes after exposure, lasting 1-2 h; severe attacks: bronchospasm, nausea, syncope; hardening after repeated exposure	Broad-spectrum photoprotection; antihistamines (H1 receptors); graduated UVA or PUVA phototherapy; severe cases: cyclosporine, plasmapheresis, omalizumab, IVIg; phototesting produces wheals within minutes	Fixed variant: local mast cell alterations; delayed variant: lesions last >24 h; drug-induced variant: tar, chlorpromazine, tetracycline
Photoexacerbated Dermatoses^b				
Brachioradial pruritus	Neuropathic disease secondary to cervical spine disease (predisposing factor) + UV exposure (eliciting factor)	Severe refractory pruritus with concomitant lichenification of the posterior neck, shoulders, and classically the forearms	Cases related to UV exposure will improve with broad-spectrum photoprotection	

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Disease	Pathophysiology	Clinical Features	Management/Prognosis	Other/Pearls
Lupus erythematosus	Complex etiology involving environmental (eg, UVR, viruses, medications) and genetic factors; UVA + UVB trigger production of cytokines (eg, TNF- α , IL-1, HMGB1, IL-18) and chemokines, which initiate an immune response	3 primary categories: acute, subacute, chronic; acute: malar rash, poikiloderma, papular erythematous transient rash following sun exposure; subacute: lesions confined to sites of sun exposure, annular lesions or papulosquamous rash; chronic: discoid lesions may result in scarring; other variants of chronic: lupus panniculitis, chilblain lupus	Photoprotection; topical or intralesional corticosteroids; topical calcineurin inhibitors; systemic therapy: hydroxychloroquine, chloroquine, quinacrine, retinoids, thalidomide, mycophenolate mofetil, azathioprine, clofazimine, sulfasalazine, corticosteroids	Histology: follicular plugging, vacuolar degeneration of basal layer, pigment incontinence, dense perivascular and periadnexal lymphocytic infiltrate (mostly DLE); DIF: irregular bandlike deposition of granular IgG and/or IgM, IgA, and complement at the dermoepidermal junction; increased risk for lupus (and other autoimmune conditions) in patients with C2 deficiency
Pellagra	Systemic nutritional disorder caused by deficiency in vitamin B ₃ (niacin); due to reduced niacin or tryptophan	Photodistributed erythema that becomes hyperpigmented and scaly; Casal's necklace: well-demarcated band on neck; cheilitis and glossitis	Diagnose by testing urinary excretion of niacin metabolites; treat with nicotinic acid supplementation (oral or IV)	Classic triad: dermatitis, diarrhea, dementia

Abbreviations: UVR, UV radiation; VL, visible light; MED, minimal erythema dose; PUVA, psoralen plus UVA; PMLE, polymorphous light eruption; IVIg, intravenous immunoglobulin; TNF- α , tumor necrosis factor α ; HMGB1, high mobility group box 1; DLE, discoid lupus erythematosus; DIF, direct immunofluorescence; IV, intravenous.
^aSee Table 2 for agents causing exogenously induced photosensitivity.
^bSee Table 3 for other photoexacerbated dermatoses.

Table 2.

Agents Causing Exogenously Induced Photosensitivity

Photoallergens		Phototoxins	
Systemic	Topical	Systemic	Topical
Dapsone	Antimicrobials	Antiarrhythmic	Antimicrobials
Griseofulvin	Bithionol	Amiodarone	Rose bengal
Ketoprofen	Fragrances	Quinidine	Tar
Piroxicam	6-methylcoumarin	Antibacterial	
Pyrazinamide	Musk ambrette	Quinolones	
Pyridoxine hydrochloride	Sandalwood oil	Sulfonamides	
Quinidine	Sunscreens	Tetracyclines	
Quinine	Benzophenones	Demeclocycline	
Quinolones	Cinnamates	Doxycycline	
Statins	PABA	Antifungal	
Sulfonamides	Salicylates	Griseofulvin	
	Others	Antimalarial	
	Promethazine	Chloroquine	
	Chlorpromazine	Quinine	
		Chemotherapy	
		Fluorouracil	
		Methotrexate	
		Vemurafenib	
		Diuretics	
		Furosemide	
		Chlorothiazide	
		Psoralens	
		Psychiatric medication	
		Alprazolam	
		Chlorpromazine	
		Doxepin	
		Prochlorperazine	
		Tricyclics	
		Others	
		NSAIDs	
		Sulfonylureas	

Abbreviations: PABA, *p*-aminobenzoic acid; NSAID, nonsteroidal anti-inflammatory drug.

Table 3.

Other Photoexacerbated Dermatoses

Acne
Atopic dermatitis
Bullous pemphigoid
Cutaneous T-cell lymphoma
Darier disease
Dermatomyositis
Disseminated superficial actinic porokeratosis
Erythema multiforme
Grover disease
Hartnup syndrome
Lichen planus
Pemphigus (foliaceus/erythematosus)
Pityriasis rubra pilaris
Reticular erythematous mucinosis
Rosacea
Seborrheic dermatitis
Viral infections (herpes)

Practice Questions

- 1. A 50-year-old woman with a history of alcoholism and new-onset diarrhea developed a painful, scaly, erythematous, and hyperpigmented eruption on the photoexposed areas on the chest and hands. A similar presentation can occur in patients on which medications?**
 - a. azathioprine
 - b. fluorouracil
 - c. pyrazinamide
 - d. A and C only
 - e. all of the above
- 2. A college student presents with a streaky blistering rash on the arms and legs. He is on summer vacation and recently started a side job of mowing lawns. This phototoxic eruption requires which light spectrum?**
 - a. 200–290 nm
 - b. 290–315 nm
 - c. 315–400 nm
 - d. 400–700 nm
 - e. none of the above
- 3. A middle-aged man with psoriasis complains of new onset of redness of the hands and face that occurs within hours of going outside. The patient may be taking which medications?**
 - a. doxepin
 - b. NSAIDs
 - c. tar shampoo
 - d. terbinafine
 - e. A, B, and C
 - f. B, C, and D
- 4. A patient with metastatic melanoma was just started on vemurafenib. Which side effect is most likely to occur from this medication?**
 - a. cough
 - b. myalgia
 - c. panniculitis
 - d. photosensitivity
 - e. squamous cell carcinoma
- 5. A 30-year-old black woman reports an itchy, flesh-colored, bumpy rash on the extensor forearms that appears 24 hours after sun exposure. There was no prior exposure to systemic or topical photoallergens. Which of the following is false regarding this condition?**
 - a. classified as a type IV hypersensitivity reaction
 - b. condition improves with subsequent exposures (hardening)
 - c. histology is characterized by mucin deposition
 - d. rash is generally nonscarring
 - e. similar reaction localized to the helices may occur in adolescent boys

Fact sheets and practice questions will be posted monthly.