

Sunscreen

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“The first line of defense against UV damage and cancers of skin: A Pharmacological Overview”

Category: Topical photoprotective agents

Purpose: Prevent UV-induced skin damage, including Sunburn, Photoaging, Actinic keratosis, Skin cancers (Melanoma, Squamous cell carcinoma, Basal cell carcinoma).

Type	Examples	Mode of Action
Chemical sunscreens	Oxybenzone, Avobenzone, Octinoxate, Octocrylene	Absorb UVA/UVB and/or convert into harmless heat
Physical sunscreens Zinc oxide, Titanium dioxide	Physical sunscreens Zinc oxide, Titanium dioxide	Physical sunscreens Zinc oxide, Titanium dioxide

Pharmacokinetics

- **Topical absorption:** Minimal for physical sunscreens; chemical agents like oxybenzone can be systemically absorbed in trace amounts.
- **Metabolism:** Applied Locally in the skin; systemic metabolism rare
- **Elimination:** Not clinically significant

Indications

- Prevention of sunburn (acute UV damage), photo-ageing (wrinkles, hyperpigmentation), photosensitive reactions (Amiodarone induced blue man syndrome, autoimmune), skin cancers (especially in high-risk patients), post-procedure care (laser, chemical peels)
- Chronic conditions like Melasma, lupus, albinism, vitiligo

Contraindications

Known **hypersensitivity** to any sunscreen ingredient (e.g., oxybenzone allergy)

- Severe acne or open wounds** in the application area (use physical blockers cautiously)
- Infants <6 months** – avoid sunscreen; use protective clothing instead.

Allergy information

Reaction	Agent	Notes
Allergic contact dermatitis	Oxybenzone, Avobenzone	Most common in chemical sunscreens
Irritant dermatitis	Fragrances, preservatives	Use hypoallergenic formulas
Photo allergy / Photosensitivity	Para-aminobenzoic acid (PABA)	Now rarely used
Acneiform eruptions	Occlusive bases	Recommend non-comedogenic formulations

Amiodarone induced Photo-sensitivity reaction

Mechanism: Amiodarone and its metabolites, possibly along with lipofuscin, accumulates within the skin's deeper layers; upon UV exposure, they generate reactive oxygen species, damaging cellular components like DNA, cell membranes, and lipids, leading to cell injury and inflammation. Prolonged amiodarone use can lead to a blue-gray discoloration of the skin, especially in sun-exposed areas.

Type of reaction: Mostly phototoxic (immediate sunburn-like reaction), but chronic use may also cause photoallergic dermatitis.

Clinical features: Erythema, burning, and exaggerated sunburn on sun-exposed areas; long-term use can cause blue-gray skin hyperpigmentation.

Risk factors: High cumulative dose, prolonged therapy (usually after months), fair skin, and frequent sun exposure.

Prevention & management: Use broad-spectrum sunscreen (SPF ≥ 50), wear protective clothing, limit direct sun exposure; if severe, consider dose reduction or discontinuation according to physician advice.

Clinical Pharmacist recommendations

Assess skin type (Fitzpatrick scale) for SPF recommendation

Check for drug-induced photosensitivity (e.g., tetracyclines, thiazides)

Guide selection:

Dry skin – Use cream/lotion

Oily/acne-prone – Gel or fluid

Children/sensitive skin – Physical blocker preferred

Formulation review: Avoid alcohol-based or fragranced products in eczema/rosacea.