Phototherapy and photochemotherapy for skin conditions

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Coverage policy

Ultraviolet A phototherapy, ultraviolet B therapy, and photochemotherapy using psoralen ultraviolet A are clinically proven and, therefore, may be medically necessary for the following skin conditions after conventional therapies have failed (Davis, 2024; Elmets, 2019; Ling, 2016; Menter, 2020; Olsen, 2016):

- Atopic dermatitis (eczema).
- Cutaneous T-cell lymphoma, including mycosis fungoides and Sézary syndrome.
- Dermatoses (other).
- Lichen planus.
- Psoriasis.
- Vitiligo.

Psoralen ultraviolet A home therapy is investigational/not clinically proven and, therefore, not medically necessary.

Ultraviolet B home phototherapy is clinically proven and, therefore, may be medically necessary when all of the following conditions are met (Davis, 2024; Elmets, 2019):

- The member is diagnosed with any of the conditions listed above.
- The member is unable to travel for office-based therapy.
- The condition is considered severe and extensive.
- Disease is refractory to conventional treatments for at least four months.
- The member requires treatment at least three times per week.

Ultraviolet B home phototherapy is investigational/not clinically proven and, therefore, not medically necessary for any of the following (Hum, 2019):

- When treatment is conducted at home for member convenience.
- When ultraviolet B therapy is used as first-line therapy.
- When ultraviolet B therapy is used for cosmetic purposes.
- For any treatment beyond a single course.
- For any condition other than those listed above.

Limitations

All other uses of psoralen ultraviolet A and narrowband ultraviolet B are investigational/not clinically proven, and therefore, not medically necessary.

Alternative covered services

Standard-of-care first-line treatments for skin conditions.

Background

Ultraviolet light, a cause of sunburns, wrinkles, and skin cancer, can be used in a medical setting as therapy for certain hard-to-treat skin problems and other medical conditions. Phototherapy is the controlled administration of non-ionizing radiation to the skin involving ultraviolet light. The main forms of phototherapy apply ultraviolet A (with or without a photosensitizing agent) and ultraviolet B (Rathod, 2023).

Psoralen ultraviolet A uses psoralens to sensitize target cells to the effects of ultraviolet A light at 320 to 400 nanometers in wavelength. Psoralen ultraviolet A treatment typically involves administration of an oral drug (e.g., methoxypsoralen) followed by exposure to ultraviolet A 45 to 60 minutes. Topical administration of psoralen ultraviolet A treatment include (Rathod, 2023):

- Bath psoralen ultraviolet A, in which the affected area is immersed in a basin of water containing 8-methoxypsoralen; it is rarely used in the United States.
- Application of 8-methoxypsoralen ointment or lotion directly to lesions on palms and plantar surfaces of the feet, followed by ultraviolet A exposure.

The original intent of psoralen ultraviolet A was treatment of psoriasis, a relatively common skin disorder. Other uses include conditions such as vitiligo and mycosis fungoides (the most common type of T-cell lymphoma).

While topical medications often control mild psoriasis, severe cases often require treatments involving ultraviolet A light exposure (Cole, 2023).

There is the potential for psoralen ultraviolet A to increase the risk of skin cancer, especially when treating psoriasis. Persons at elevated risk for skin cancer from psoralen ultraviolet A include children and persons with a genetic predisposition, a history of skin cancer, or a history of at least 150 prior psoralen ultraviolet A treatments. Types of toxicity to psoralen ultraviolet A include erythema, pruritus, xerosis, irregular pigmentation, and gastrointestinal symptoms. Altering or dividing the dose can avoid most toxicity (Cole, 2023).

Oral psoralen ultraviolet A is contraindicated in patients younger than 10 years, pregnant patients, nursing mothers, and patients with a personal history of melanoma, lupus erythematosus, or xeroderma pigmentosa (Elmets, 2019). Caution should be exercised for: patients age 10 to 18 years; patients with skin types 1 and 2 who tend to burn easily; those with a history of dysplastic nevi, photosensitivity, melanoma or nonmelanoma skin cancer; or those with exposure to carcinogenic agents (e.g., arsenic intake or ionizing radiation) or immunosuppressive agents.

Available forms of ultraviolet B treatment are broadband, narrowband, and targeted applications. Broadband emits wavelengths ranging from 270 to 390 nanometers. Narrowband emits wavelengths ranging from 311 to 313 nanometers. Targeted ultraviolet B treatments may employ narrowband, excimer laser (308 nanometers), or excimer light (308 nanometers) (Elmets, 2019).

Findings

Phototherapy and photochemotherapy are well-established treatment modalities for several dermatologic conditions, supported by clinical practice guidelines from major professional societies and a substantial body of evidence from systematic reviews and meta-analyses. The evidence consistently demonstrates that narrowband ultraviolet B phototherapy and psoralen ultraviolet A photochemotherapy are effective treatments for psoriasis, atopic dermatitis, vitiligo, cutaneous T-cell lymphoma including mycosis fungoides and Sézary syndrome, and lichen planus. Narrowband ultraviolet B has emerged as the preferred phototherapy modality for most conditions due to its favorable efficacy and safety profile, while psoralen ultraviolet A remains the treatment of choice for certain indications such as mycosis fungoides beyond patch stage and palmoplantar psoriasis. Home-based narrowband ultraviolet B phototherapy has been shown to be a safe and effective alternative to office-based treatment for selected patients with access barriers. The following sections organize the evidence thematically by study type to facilitate assessment of the strength and consistency of findings across the covered indications.

Guidelines

Professional society guidelines from the United States provide the foundation for phototherapy recommendations across multiple skin conditions. The American Academy of Dermatology and the National Psoriasis Foundation jointly published comprehensive phototherapy guidelines for psoriasis management, establishing narrowband ultraviolet B as the technique of choice for treating psoriasis in adults (Elmets, 2019). These guidelines recommend that narrowband ultraviolet B be typically administered three times per week and may be used as monotherapy or in combination with oral or topical medications to increase efficacy. Targeted ultraviolet treatment options may be appropriate for localized lesions. The guidelines support narrowband ultraviolet B phototherapy or oral psoralen ultraviolet A over broadband ultraviolet B as monotherapy, though broadband ultraviolet B therapy may be used when narrowband ultraviolet B therapy is unavailable.

The American Academy of Dermatology psoriasis guidelines address specific clinical scenarios and patient populations (Elmets, 2019). For localized plaque psoriasis, particularly palmoplantar psoriasis and palmoplantar pustular psoriasis, topical psoralen ultraviolet A phototherapy is recommended over narrowband ultraviolet B phototherapy. Bath psoralen ultraviolet A is recommended for treatment of moderate to severe plaque psoriasis. Combination therapy is recommended for patients with generalized plaque psoriasis who do not respond adequately to monotherapy. Home narrowband ultraviolet B phototherapy is recommended for patients for whom travel to an outpatient facility is a limiting factor, and guideline-directed maintenance phototherapy is endorsed to maintain clinical response.

The guidelines also address contraindications and precautions for phototherapy (Elmets, 2019). Narrowband ultraviolet B is contraindicated in patients with photosensitive disorders such as xeroderma pigmentosa and should be used cautiously in patients with a history of melanoma, multiple nonmelanoma skin cancers, arsenic intake, or exposure to ionizing radiation. Narrowband ultraviolet B is considered safe to use in pregnant patients and may be used cautiously in patients with lupus erythematosus who have no history of photosensitivity and are Ro antibody negative. Oral psoralen ultraviolet A is contraindicated in patients younger than 10 years, pregnant patients, nursing mothers, and patients with a personal history of melanoma, lupus erythematosus, or xeroderma pigmentosa.

For pediatric psoriasis, the American Academy of Dermatology and National Psoriasis Foundation recommend narrowband ultraviolet B phototherapy for moderate to severe pediatric plaque and guttate psoriasis (Menter, 2020). Excimer laser or psoralen ultraviolet A therapy may be efficacious and well-tolerated in children, but the supportive evidence for these options is limited.
The American Academy of Dermatology published updated guidelines for atopic dermatitis management in adults in 2023. The guidelines conditionally recommend phototherapy, primarily narrowband ultraviolet B, for adults with atopic dermatitis based on low certainty evidence of safety and efficacy (Davis, 2024). There are insufficient data to make a recommendation regarding psoralen ultraviolet A phototherapy for adults with atopic dermatitis.

For mycosis fungoides and Sézary syndrome, the United States Cutaneous Lymphoma Consortium provides stage-based phototherapy recommendations (Olsen, 2016). The consortium guidelines suggest a refined approach based on patient stage and treatment centers, with phototherapy used in combination with other agents in practice and clinical trials. Psoralen ultraviolet A is generally considered the first-line phototherapy for cutaneous T-cell lymphoma, while narrowband ultraviolet B can be used in early stages of the disease.
The British Association of Dermatologists and British Photodermatology Group published guidelines for psoralen ultraviolet A therapy that provide additional international perspective on phototherapy indications (Ling, 2016). For psoriasis, narrowband ultraviolet B is the preferred treatment, with psoralen ultraviolet A indicated for chronic plaque psoriasis and atopic eczema if ultraviolet B treatment is ineffective. For certain indications, psoralen ultraviolet A is the first-line phototherapy, including mycosis fungoides beyond patch stage, pustular psoriasis, pompholyx, hand and foot eczema, and adult generalized pityriasis rubra pilaris. For eczema, narrowband ultraviolet B is the first-line phototherapy. For vitiligo, narrowband ultraviolet B is at least as effective as psoralen ultraviolet A. For photodermatoses and hand and foot dermatoses, ultraviolet A and ultraviolet B are equally effective, though safety concerns exist for photodermatoses.

Systematic Reviews

Systematic reviews have examined phototherapy efficacy for psoriasis, the condition most studied for phototherapy outcomes. While the optimal treatment protocol has not been established, systematic reviews confirm that phototherapy used as monotherapy or in combination offers a safe and effective treatment option (Damiani, 2022; Li, 2022). A systematic review of 35 studies found that systemic treatment for psoriasis, including ultraviolet B phototherapy, reduced pruritus but did not reduce prevalence of lesions (Therene, 2018). A systematic review of 29 articles encompassing 675 participants with palmoplantar pustular psoriasis found that phototherapy, cyclosporine, and topical corticosteroids each controlled the condition, with psoralen ultraviolet A demonstrating greater efficacy than ultraviolet B therapy (Sevrain, 2014).

Carcinogenic risk is a concern for patients undergoing ultraviolet light treatment, and systematic reviews have examined this issue across skin phototypes. Lighter skin phototypes are well-studied, as numerous studies have been conducted on Caucasian patients. Darker phototypes have increased morbidity and mortality for skin cancer due to atypical lesions or advanced stage at presentation.. A systematic review of eight studies analyzed skin cancer risk with different types of phototherapy according to Fitzpatrick skin phototype, which uses human skin pigmentation and reaction to ultraviolet light to rank skin phototypes from one to six for determining initial dosing (Thatiparthi, 2022). While cutaneous oncogenic risk was reported in some studies, contradictory evidence and limited reporting of Fitzpatrick skin phototype prevented drawing strong conclusions about the oncogenic risk in psoriasis patients based on skin phototypes. A 2025 systematic review examined narrowband ultraviolet B phototherapy outcomes specifically in patients with skin of color, finding the treatment effective for psoriasis in this population (Hauptman, 2025).

For atopic dermatitis, a Cochrane review included 32 trials of 1,219 participants from secondary care dermatology clinics with a range of severities who underwent any form of phototherapy (Musters, 2021). Low-certainty evidence supported all reported outcomes, with the strongest evidence suggesting that narrowband ultraviolet B may improve physician-rated signs, patient-reported symptoms, and investigator global assessment after 12 weeks compared to placebo or no treatment, without a difference in withdrawal due to adverse events. Comparisons to other forms of phototherapy were inconclusive. An analysis of 28 systematic reviews found reasonable evidence that ultraviolet B treatment is effective for atopic eczema (Solman, 2019). A systematic review of 22 studies with low risk of bias concluded that various treatments, including ultraviolet radiation, were effective treatments for eczema (Nankervis, 2017).

Additional systematic reviews have examined specific phototherapy modalities for atopic dermatitis. A systematic review of 21 randomized controlled trials including 961 participants determined that narrowband ultraviolet B and ultraviolet A1 phototherapy were helpful in moderate to severe atopic dermatitis, but data on psoralen ultraviolet A use and phototherapy in children are scarce (Perez-Ferriols, 2015). Another systematic review of 19 studies encompassing 905 participants found that ultraviolet A1 and narrowband ultraviolet B were the most effective treatments for reducing signs and symptoms of atopic dermatitis (Garritsen, 2014).

For vitiligo, systematic reviews demonstrate that ultraviolet phototherapy is a safe treatment that poses no significant risk of skin cancer (Wu, 2022). A systematic review determined that narrowband ultraviolet B had fewer side effects and was marginally better than psoralen ultraviolet A for vitiligo, and that narrowband ultraviolet B along with topical corticosteroids offered the greatest benefits of any vitiligo treatment (Whitton, 2015). A systematic review of seven studies encompassing 232 participants comparing vitiligo treatment by psoralen ultraviolet A and narrowband ultraviolet B revealed no statistically significant difference between the two

modalities on the rate of participants who achieved more than 50 % or more than 75 % repigmentation (Xiao, 2015). Multiple systematic reviews have examined combination therapy for vitiligo repigmentation, with results suggesting that combination therapy using either narrowband ultraviolet B phototherapy or excimer laser with tacrolimus (Chang, 2021), or narrowband ultraviolet B, psoralen ultraviolet A, or excimer laser with calcipotriol (Hu, 2021) may provide greater clinical improvement than phototherapy alone. The results supporting the superiority of narrowband ultraviolet B combined with fractional carbon dioxide laser are mixed, likely resulting from heterogeneous selection criteria and treatment protocols (Chang, 2020; Kim, 2021).

For mycosis fungoides, systematic reviews support psoralen ultraviolet A and narrowband ultraviolet B monotherapy as effective first-line interventions, though the effectiveness of psoralen ultraviolet A either as maintenance therapy or combined with drugs as first-line therapy is uncertain but may be beneficial for relapse and late-stage disease (Dogra, 2015). %%A Cochrane review of 20 randomized controlled trials encompassing 1,369 participants included five studies addressing psoralen ultraviolet A and found no evidence challenging the general consensus that it be used as first-line treatment for mycosis fungoides (Valipour, 2020). A review of 20 papers documented photodynamic therapy as a promising and well-tolerated option for treating localized lesions, with excellent cosmetic outcomes (Xue, 2017).

For lichen planus, a Cochrane review of 16 studies, 11 of which were randomized controlled trials, found that psoralen ultraviolet A treatment for cutaneous lichen planus had comparable outcomes to psoralen ultraviolet A bath and narrowband ultraviolet B (Atzmony, 2016). A review of 14 studies encompassing 64 pediatric participants with pityriasis lichenoides determined that broadband ultraviolet B, narrowband ultraviolet B, and psoralen ultraviolet A had initial clearance rates of 90 %, 73 %, and 83 % respectively, with recurrence rates of 23.1 %, zero %, and 60 % respectively (Maranda, 2016). An analysis of two systematic reviews and nine randomized controlled trials upheld the efficacy of narrowband ultraviolet B treatment for lichen planus (Fazel, 2015).

For home-based phototherapy, several systematic reviews have identified criteria for selecting patients who are candidates for home narrowband ultraviolet B phototherapy (Ashraf, 2022; Cohen, 2022). Home phototherapy is feasible for many patients for whom office-based phototherapy is not accessible, such as patients who live far from a phototherapy center, are unable to travel because of extensive disease, or face prohibitive travel costs. A 2020 systematic review found limited randomized trial evidence for narrowband ultraviolet B phototherapy home treatment and noted that other observational studies were heterogeneous with respect to types of ultraviolet light used, making comparisons across studies difficult (Ontario Health [Quality], 2020). Systematic reviews of randomized controlled trials confirmed that home-based phototherapy for psoriasis (Damiani, 2022; Li, 2022), vitiligo (Wu, 2022), and atopic dermatitis (Xiao, 2022) are safe and effective treatment options, although the optimal treatment administration has not been determined. Treatment schedules generally vary based on skin condition, but narrowband ultraviolet B at 311 nanometers administered on alternating days has been recommended as a safe and effective treatment mode for home phototherapy (Hum, 2019).

Meta-Analyses

Meta-analyses provide quantitative synthesis of treatment effects across multiple studies, strengthening conclusions about phototherapy efficacy. For psoriasis, a systematic review and meta-analysis of 10 studies of pediatric psoriasis found narrowband ultraviolet B to be effective, with response rates varying by outcome measure (Kim, 2020). A meta-analysis of 23 studies encompassing 765 participants found psoralen ultraviolet A

to be more efficacious than targeted ultraviolet B phototherapy for localized psoriasis, although both treatments had positive outcomes (Almutawa, 2015). A network meta-analysis of randomized controlled trials confirmed the efficacy and safety of narrowband ultraviolet B and psoralen ultraviolet A phototherapy for psoriasis (Li, 2022). A 2025 systematic review and meta-analysis examining narrowband ultraviolet B phototherapy in patients with skin of color found the treatment effective in this population (Hauptman, 2025).
For vitiligo, a meta-analysis of 35 studies compared narrowband ultraviolet B phototherapy in 1,201 participants to psoralen ultraviolet A phototherapy in 227 participants (Bae, 2017). The narrowband ultraviolet B group had more responses rated as at least mild at six and 12 months after therapy (74.2 % and 75.0 %) than did the psoralen ultraviolet A group (51.4 % and 61.6 %). Marked responses were more common in the face and neck (44.2 %) than in the trunk (26.1 %) and the extremities (17.3 %) after six months of narrowband ultraviolet B phototherapy. A systematic review and network meta-analysis of 22 randomized controlled trials encompassing 1,194 participants concluded that hospital-based narrowband ultraviolet B combined with adjunctive therapies such as carboxytherapy, erbium-doped yttrium aluminum garnet laser plus topical fluorouracil, needling or microneedling, betamethasone intramuscular injection, or topical tacrolimus was more efficacious than monotherapy in inducing a successful repigmentation response rate of 75 % or greater (Zhu, 2023). Narrowband ultraviolet B combined with either erbium-doped yttrium aluminum garnet laser plus topical fluorouracil or needling and microneedling would be the preferred therapeutic approaches, as they were less likely to result in an ineffective repigmentation response. Commonly reported phototoxic effects were erythema, edema, pruritus, pain, and burning sensation, and two studies reported serious adverse effects of Koebner phenomenon and scarring.

For mycosis fungoides, a meta-analysis of seven studies encompassing 778 participants compared 527 patients treated with psoralen ultraviolet A and 251 patients treated with narrowband ultraviolet B (Phan, 2019). The psoralen ultraviolet A group had superior outcomes in % with any response and complete response. Rates of adverse effects were similar between the two treatment modalities.

Other Evidence
Randomized controlled trials provide direct evidence of treatment efficacy in controlled settings. For home-based phototherapy, the PLUTO study was a multicenter pragmatic randomized controlled trial of 196 participants that concluded home narrowband ultraviolet B delivered at practitioner-determined dosing schedules was as safe, effective, and cost-effective as outpatient treatment for mild to severe psoriasis, was more convenient, and generated higher satisfaction compared to outpatient treatment (Koek, 2009). The LITE trial, a pragmatic multicenter noninferiority randomized clinical trial conducted across 42 United States dermatology practices, enrolled 783 participants aged 12 years or older with plaque or guttate psoriasis and compared home-based to office-based narrowband ultraviolet B phototherapy over a 12-week treatment period (Gelfand, 2024). Home-based phototherapy was noninferior to office-based phototherapy for both coprimary endpoints of physician global assessment clear or almost clear and dermatology life quality index score of five or lower. The trial found that home-based phototherapy was as effective as office-based phototherapy for plaque or guttate psoriasis in everyday clinical practice and had less burden to patients.

New indications for phototherapy and photochemotherapy are emerging, though current evidence is insufficient and no guidelines support routine clinical use for these conditions. In patients with systemic sclerosis, limited low-quality evidence from small observational studies and individual case reports suggests ultraviolet A at 340 to 400 nanometers and psoralen ultraviolet A reduced skin thickening and increased skin elasticity with no

serious side effects (Miziołek, 2022). A systematic review of 31 case series examined the safety and effectiveness of light- and laser-based treatments for granuloma annulare, finding clearance rates for phototherapies of 59 % for psoralen ultraviolet A, 31 % for ultraviolet A, and 40 % for ultraviolet B or narrowband ultraviolet B (Mukovozov, 2022). Although psoralen ultraviolet A had a higher complete response rate, concerns for carcinogenesis may limit its use and instead favor ultraviolet B modalities for their moderate effectiveness and safety profile. For port wine stains, a systematic review and meta-analysis found low-quality evidence from three randomized clinical trials and 23 cohort studies supporting the safety and effectiveness of photodynamic therapy, with 51.5 % of participants achieving at least a 60 % improvement in port wine stain appearance (Wang, 2023). A Cochrane review of 37 randomized controlled trials encompassing 1,663 participants found insufficient evidence supporting the effectiveness of various interventions for chronic palmoplantar pustulosis, including ultraviolet A phototherapy (Obeid, 2020).

In 2026, the findings section was reorganized into thematic subsections covering guidelines, systematic reviews, meta-analyses, and other evidence. The LITE randomized clinical trial (Gelfand, 2024) was added. A 2025 systematic review and meta-analysis on narrowband ultraviolet B phototherapy outcomes in patients with skin of color (Hauptman, 2025) was also added. No policy changes were warranted.

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On January 8, 2026, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were “phototherapy," "photochemotherapy," “PUVA therapy,” “UVA,” “UVB,” “psoriasis,” “vitiligo,” “eczema,” “mycosis,” and “fungoides.” We included the best available evidence according to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.

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Policy updates

5/2015: initial review date and clinical policy effective date: 10/2015

5/2016: Policy references updated.

4/2017: Policy references updated.

3/2018: Policy references updated.

5/2019: Policy references updated. The policy ID changed to CCP.1169.

3/2020: Policy references updated.

2/2021: Policy references updated.

2/2022: Policy references updated.

2/2023: Policy references updated.

2/2024: Policy references updated.

2/2025: Policy references updated.
2/2026: Policy references updated.

Related Codes

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy CCP.1169. This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.

Code	Code Description
96900	Actinotherapy (ultraviolet light)
96910	Photochemotherapy; tar and ultraviolet B (Goeckerman therapy)
96912	Photochemotherapy; psoralens and ultraviolet A (PUVA)
96920	Laser treatment for inflammatory skin disease (psoriasis); total area < 250 sq cm
96921	Laser treatment for inflammatory skin disease (psoriasis); total area 250 sq cm to 500 sq cm
96922	Laser treatment for inflammatory skin disease (psoriasis); total area > 500 sq cm
E0691	Ultraviolet light therapy system panel, includes bulbs/lamps, timer, and eye protection; treatment area 2 square feet or less
E0692	Ultraviolet light therapy system panel, includes bulbs/lamps, timer, and eye protection; treatment area 2 to 4 square feet
E0693	Ultraviolet light therapy system panel, includes bulbs/lamps, timer, and eye protection; treatment area greater than 4 square feet
E0694	Ultraviolet multidirectional light therapy system in 6-foot cabinet, includes bulbs/lamps, timer, and eye protection