Light Therapy for Psoriasis and Eczema

Policy Number: 2.01.47  Last Review: 5/2019

Policy
Blue Cross and Blue Shield of Kansas City (Blue KC) will provide coverage for light therapy when it is determined to be medically necessary because the criteria shown below are met.

When Policy Topic is covered
PUVA for the treatment of severe, disabling psoriasis, which is not responsive to other forms of conservative therapy (e.g., topical corticosteroids, coal/tar preparations, and ultraviolet light), may be considered medically necessary.

Targeted phototherapy may be considered medically necessary for the treatment of moderate to severe localized psoriasis (i.e., comprising less than 20% body area) for which NB-UVB or PUVA are indicated.

Targeted phototherapy may be considered medically necessary for the treatment of mild to moderate localized psoriasis that is unresponsive to conservative treatment.

Targeted phototherapy may be considered medically necessary for the treatment of eczema with the presence of skin complications (e.g. bleeding, infection) that has been unresponsive to conservative treatment (topical drugs, oral corticosteroids, immunomodulators, and immunosuppressants).

When Policy Topic is not covered
Targeted phototherapy is considered investigational for the first-line treatment of mild psoriasis.

Targeted phototherapy is considered investigational for the treatment of generalized psoriasis or psoriatic arthritis.

Considerations
Disease severity is minimally defined by body surface area (mild psoriasis affects less than 5% of the body’s surface area, moderate psoriasis affects 5% to 10%,
and severe disease affects more than 10% body surface area), lesion characteristics (e.g., location and severity of erythema, scaling, induration, and pruritus) and impact on quality of life are also taken into account. (1-3) For example, while one handprint is equal to approximately 1% body surface area, lesions on the hands, feet, or genitalia that cause disability may be classified as moderate to severe. The Psoriasis Area and Severity Index (PASI) may be used as an outcome measure in clinical research, clinical assessment of disease severity is qualitative.

In 2002, CPT established separate codes (96920-96922) that describe ultraviolet light laser treatment for inflammatory disease (psoriasis) according to the surface area of skin treated (total area less than 250 sq cm, 250 sq cm–500 sq cm, over 500 sq cm).

The laser treatment codes are distinct from codes that describe the dermatological use of ultraviolet light, also known as actinotherapy (96900), and photochemotherapy (96910-96913).

Established treatments for psoriasis include use of topical ointments and ultraviolet light ("light lamp") treatments. Lasers and targeted ultraviolet B (UVB) lamps are considered equivalent devices; targeted UV devices are comparable to UV light panels for treatment purposes. First-line treatment of UV-sensitive lesions may involve around 6–10 office visits; treatment of recalcitrant lesions may involve around 24–30 office visits. Maintenance therapy or repeat courses of treatment may be required.

During a course of PUVA therapy, the patient needs to be assessed on a regular basis to determine the effectiveness of the therapy and the development of adverse effects. These evaluations are essential to ensure that the exposure dose of radiation is kept to the minimum compatible with adequate control of disease. Therefore, PUVA is generally not recommended for home therapy.

### Description of Procedure or Service

<table>
<thead>
<tr>
<th>Populations</th>
<th>Interventions</th>
<th>Comparators</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| Individuals:  
  • With mild localized psoriasis | Interventions of interest are:  
  • Targeted phototherapy | Comparators of interest are:  
  • Topical medications | Relevant outcomes include:  
  • Symptoms  
  • Change in disease status  
  • Quality of life  
  • Treatment-related morbidity |
| Individuals:  
  • With mild psoriasis that is resistant to topical medications | Interventions of interest are:  
  • Targeted phototherapy | Comparators of interest are:  
  • Ultraviolet B light box therapy | Relevant outcomes include:  
  • Symptoms  
  • Change in disease status  
  • Quality of life  
  • Treatment-related morbidity |
| Individuals:  
  • With moderate-to-severe localized psoriasis | Interventions of interest are:  
  • Targeted phototherapy | Comparators of interest are:  
  • Ultraviolet B light box therapy | Relevant outcomes include:  
  • Symptoms  
  • Change in disease status  
  • Quality of life |
Light therapy for psoriasis includes both targeted phototherapy and photochemotherapy with psoralen plus ultraviolet A (PUVA). Targeted phototherapy describes the use of ultraviolet light that can be focused on specific body areas or lesions. PUVA uses a psoralen derivative in conjunction with long wavelength ultraviolet A (UVA) light (sunlight or artificial) for photochemotherapy of skin conditions.

For individuals who have mild psoriasis who receive targeted phototherapy, there is little evidence. Relevant outcomes are symptoms, change in disease status, quality of life, and treatment-related morbidity. Evidence is lacking on the use of targeted phototherapy as first-line treatment of mild psoriasis. In addition, the American Academy of Dermatology does not recommend phototherapy for patients with mild localized psoriasis whose disease can be controlled with topical medications. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have mild psoriasis that is resistant to topical medications who receive targeted phototherapy, the evidence includes small within-subject studies. Relevant outcomes are symptoms, change in disease status, quality of life, and treatment-related morbidity. The available pre-post studies have shown that targeted phototherapy can improve mild localized psoriasis (<10% body surface area) that has not responded to topical treatment. Targeted phototherapy is presumed to be safer or at least no riskier than whole body phototherapy, due to risks of exposing the entire skin to the carcinogenic effects of UVB light. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have moderate-to-severe localized psoriasis who receive targeted phototherapy, the evidence includes randomized controlled trials (RCTs) and systematic reviews of RCTs. Relevant outcomes are symptoms, change in disease status, quality of life, and treatment-related morbidity. Systematic reviews of small RCTs and non-RCTs in patients with moderate-to-severe psoriasis have found that targeted phototherapy has efficacy similar to whole body phototherapy and supports the use of targeted phototherapy for the treatment of moderate-to-severe psoriasis comprising less than 20% of body surface area for which narrowband UVB or photochemotherapy with PUVA are indicated. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.
For individuals who have generalized psoriasis who receive PUVA, the evidence includes RCTs and systematic reviews. Relevant outcomes are symptoms, change in disease status, quality of life, and treatment-related morbidity. RCTs and systematic reviews of RCTs have found that PUVA is more effective than narrowband UVB, topical steroids, or UVA without psoralens in patients with generalized psoriasis. In addition, PUVA for psoriasis that has failed topical medication or targeted phototherapy or extensive disease is well-accepted and is recommended by the American Academy of Dermatology. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

**Background**
Psoriasis is a common chronic immune-mediated disease characterized by skin lesions ranging from minor localized patches to complete body coverage. There are several types of psoriasis; most common is plaque psoriasis which is associated with red and white scaly patches on the skin. In addition to being a skin disorder, psoriasis can negatively impact many organ systems and is associated with an increased risk of cardiovascular disease, some types of cancer, and autoimmune diseases such as celiac disease and Crohn disease. Although disease severity is minimally defined by body surface area (mild psoriasis affects less than 5% of the body’s surface area, moderate psoriasis affects 5% to 10%, and severe disease affects more than 10% body surface area), lesion characteristics (eg, location and severity of erythema, scaling, induration, pruritus) and impact on quality of life are also taken into account.1-3

Topical therapy (eg, corticosteroids, vitamin D analogs) is generally considered to be first-line treatment of psoriasis, especially for mild disease. Phototherapy and systemic therapy are treatment options for patients with more extensive and/or severe disease and those who fail conservative treatment with topical agents. Phototherapy is available in various forms including exposure to natural sunlight, use of broadband ultraviolet B (BB-UVB) devices, narrowband ultraviolet B (NB-UVB) devices, and psoralen plus ultraviolet A (PUVA). This evidence review addresses 2 treatments: PUVA and targeted phototherapy, which uses ultraviolet light that can be focused on specific body areas or lesions.

**Targeted Phototherapy**
Potential advantages of targeted phototherapy include the ability to use higher treatment doses and to limit exposure to surrounding tissue. BB-UVB devices, which emit wavelengths from 290 to 320 nm, have been largely replaced by NB-UVB devices. NB-UVB devices eliminate wavelengths below 296 nm, which are considered erythemogenic and carcinogenic but not therapeutic. NB-UVB is more effective than BB-UVB and approaches PUVA in efficacy. Original NB-UVB devices consisted of a Phillips TL-01 fluorescent bulb with a maximum wavelength (lambda max) at 311 nm. Subsequently, xenon chloride (XeCl) lasers and lamps were developed as targeted NB-UVB treatment devices; they generate monochromatic or very narrow band radiation with a lambda max of 308 nm. Targeted phototherapy devices are directed at specific lesions or affected areas, thus limiting exposure to the surrounding normal tissues. They may therefore allow
higher dosages compared with a light box, which could result in fewer treatments to produce clearing. The original indication of the excimer laser was for patients with mild-to-moderate psoriasis, defined as involvement of less than 10% of the skin. Newer XeCl laser devices are faster and more powerful than the original models, which may allow treatment of patients with more extensive skin involvement (10%-20% body surface area).

Psoralen Plus Ultraviolet A
PUVA uses a psoralen derivative in conjunction with long wavelength UVA light (sunlight or artificial) for photochemotherapy of skin conditions. Psoralens are tricyclic furocoumarins that occur in certain plants and can also be synthesized. They are available in oral and topical forms. Oral PUVA is generally given 1.5 hours before exposure to UVA radiation. Topical PUVA therapy refers to directly applying the psoralen to the skin with subsequent exposure to UVA light. Bath PUVA is used in some European countries for generalized psoriasis, but the agent used, trimethylpsoralen, is not approved by the Food and Drug Administration. Paint PUVA and soak PUVA are other forms of topical application of psoralen and are often used for psoriasis localized to the palms and soles. In paint PUVA, 8-methoxypsoralen (8-MOP) in ointment or lotion form is put directly on the lesions. With soak PUVA, the affected areas of the body are placed in a basin of water containing psoralen. With topical PUVA, UVA exposure is generally administered within 30 minutes of psoralen application.

PUVA has most commonly been used to treat severe psoriasis, for which there is no generally accepted first-line treatment. Each treatment option (eg, systemic therapies such as methotrexate, phototherapy, biologic therapies) has associated benefits and risks. Common minor toxicities associated with PUVA include erythema, pruritus, irregular pigmentation, and gastrointestinal tract symptoms; these generally can be managed by altering the dose of psoralen or UV light. Potential long-term effects include photoaging and skin cancer, particularly squamous cell carcinoma and possibly malignant melanoma. PUVA is generally considered more effective than targeted phototherapy for the treatment of psoriasis. However, the requirement of systemic exposure and the higher risk of adverse reactions (including a higher carcinogenic risk) have generally limited PUVA therapy to patients with more severe disease.

Regulatory Status
In 2001, an XeCl excimer laser (XTRAC™ by PhotoMedex) received 510(k) clearance from the U.S. Food and Drug Administration (FDA) for the treatment of mild to moderate psoriasis. The 510(k) clearance has subsequently been obtained for a number of targeted UVB lamps and lasers, including newer versions of the XTRAC system including the XTRAC Ultra™, the VTRAC™ lamp (PhotoMedex), the BClear™ lamp (Lumenis), and the European manufactured Excilite™ and Excilite µ™ XeCl lamps.

In 2010, the Levia Personal Targeted Phototherapy® UVB device (Daavlin, Bryan, OH; previously manufactured by Lerner Medical Devices, Los Angeles, CA) was
cleared for marketing by FDA through the 510(k) process for home treatment of psoriasis.

The oral psoralen products Oxsoralen-Ultra (methoxsalen soft gelatin capsules) and 8-MOP (methoxsalen hard gelatin capsules) have been approved by the FDA; both are made by Valeant Pharmaceuticals. Topical psoralen products have also received FDA approval e.g., Oxsoralen (Valeant Pharmaceuticals).

**Rationale**

This evidence review was created in November 2001 and has been updated regularly with searches of the MEDLINE database. The most recent literature update was performed through October 30, 2018.

Evidence reviews assess the clinical evidence to determine whether the use of technology improves the net health outcome. Broadly defined, health outcomes are the length of life, quality of life, and ability to function including benefits and harms. Every clinical condition has specific outcomes that are important to patients and managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of technology, two domains are examined: the relevance, and quality and credibility. To be relevant, studies must represent one or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. RCTs are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

The most appropriate comparator for targeted therapy is narrowband ultraviolet B (NB-UVB), which is an established treatment for psoriasis and can be administered in the home. The efficacy of psoralen plus ultraviolet A (PUVA) has been compared with NB-UVB, which has fewer side effects, or with ultraviolet A (UVA) with placebo.

**Targeted Phototherapy for Mild Localized Psoriasis**
Clinical Context and Therapy Purpose
The purpose of targeted phototherapy is to provide a treatment option that is an alternative to or an improvement on existing therapies in patients with mild localized psoriasis.

The question addressed in this evidence review is: Does the use of targeted phototherapy improve the net health outcome in patients with localized or generalized psoriasis?

The following PICOTS were used to select literature to inform this review.

Patients
The relevant population of interest are individuals with mild localized psoriasis.

Interventions
The therapy being considered is targeted phototherapy.

Comparators
The following therapy is currently being used to treat localized or generalized psoriasis: topical medication.

Outcomes
The general outcomes of interest are symptoms, change in disease status, quality of life, and treatment-related morbidity.

Timing
Though not completely standardized, follow-up for mild localized psoriasis symptoms would typically occur in the months to years after starting treatment.

Setting
Patients with mild localized psoriasis are actively managed by dermatologists and primary care providers in an outpatient setting.

Study Selection Criteria
Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
- Studies with duplicative or overlapping populations were excluded.

Evidence Base
The original indication of the excimer laser was mild-to-moderate psoriasis, defined as involvement of less than 10% of the skin. Typically, this patient population has not been considered for light box therapy, because the risks of
exposing the entire skin to the carcinogenic effects of ultraviolet B (UVB) light may outweigh the benefits of treating a small number of lesions. The American Academy of Dermatology does not recommend phototherapy for patients with mild localized psoriasis whose disease can be controlled with topical medications, including steroids, coal tar, vitamin D analogues (eg, calcipotriol, calcitriol), tazarotene, and anthralin.4.

**Section Summary: Mild Localized Psoriasis**
There is no evidence and no clinical recommendation for targeted phototherapy to treat patients with mild localized psoriasis whose disease can be controlled with topical medications.

**Targeted Phototherapy for Treatment-Resistant Mild Psoriasis**

**Clinical Context and Therapy Purpose**
The purpose of targeted phototherapy is to provide a treatment option that is an alternative to or an improvement on existing therapies in patients with mild psoriasis that is resistant to topical medications.

The question addressed in this evidence review is: Does the use of targeted phototherapy improve the net health outcome in patients with localized or generalized psoriasis?

The following PICOTS were used to select literature to inform this review.

**Patients**
The relevant population of interest are individuals with mild psoriasis that is resistant to topical medications.

**Interventions**
The therapy being considered is targeted phototherapy.

**Comparators**
The following therapy is currently being used to treat mild psoriasis resistant to topical medications: ultraviolet B light box therapy.

**Outcomes**
The general outcomes of interest are symptoms, change in disease status, quality of life, and treatment-related morbidity.

**Timing**
Though not completely standardized, follow-up for mild psoriasis that is resistant to topical medications symptoms would typically occur in the months to years after starting treatment.

**Setting**
Patients with mild psoriasis that is resistant to topical medications are actively managed by dermatologists and primary care providers in an outpatient setting.
Study Selection Criteria
Methodologically credible studies were selected using the principles outlined for indication 1.

Evidence Base
Several small studies have suggested that targeted phototherapy can be effective for treatment-resistant lesions. One 2003 patch comparison reported effective clearing (pre-Psoriasis Area and Severity Index [PASI] score, 6.2; post-PASI score, 1.0) of treatment-resistant psoriatic lesions; six of the patients had previously received topical treatment, five had received conventional phototherapy, and three had received combined treatments including phototherapy. In 2004, the same investigator group reported that 12 of 13 patients with “extensive and stubborn” scalp psoriasis (ie, unresponsive to class I topical steroids used in conjunction with tar and/or zinc pyrithione shampoos for at least 1 month) showed clearing following treatment with the 308-nm laser. In a 2006 open trial from Europe, 44 (81%) of 54 patients with palmoplantar psoriasis resistant to combined phototherapy and systemic treatments were cleared of lesions with a single NB-UVB lamp treatment weekly for 8 weeks.

Section Summary: Treatment-Resistant Mild Psoriasis
Several nonrandomized studies have found that targeted phototherapy can improve health outcomes in patients with treatment-resistant psoriasis.

Targeted Phototherapy for Moderate-to-Severe Localized Psoriasis

Clinical Context and Therapy Purpose
The purpose of targeted phototherapy is to provide a treatment option that is an alternative to or an improvement on existing therapies in patients with moderate-to-severe localized psoriasis.

The question addressed in this evidence review is: Does the use of targeted phototherapy improve the net health outcome in patients with localized or generalized psoriasis?

The following PICOTS were used to select literature to inform this review.

Patients
The relevant population of interest are individuals with moderate-to-severe localized psoriasis.

Interventions
The therapy being considered is targeted phototherapy.

Comparators
The following therapy is currently being used to treat moderate-to-severe localized psoriasis: ultraviolet B light box therapy.
Outcomes
The general outcomes of interest are symptoms, change in disease status, quality of life, and treatment-related morbidity.

Timing
Though not completely standardized, follow-up for moderate-to-severe localized psoriasis symptoms would typically occur in the months to years after starting treatment.

Setting
Patients with moderate-to-severe localized psoriasis are actively managed by dermatologists and primary care providers in an outpatient setting.

Study Selection Criteria
Methodologically credible studies were selected using the principles outlined in indication 1.

Systematic Reviews
There are several systematic reviews of the literature on targeted phototherapy. Reviews differed in the type of study selected and the comparison interventions. A systematic review by Almutawa et al (2015) considered only RCTs; PUVA was the comparison intervention. Reviewers identified three RCTs comparing the efficacy of targeted UVB phototherapy with PUVA for treatment of plaque psoriasis. Two of the 3 trials used an excimer laser (308 nm) as the source of targeted phototherapy, and the third used localized NB-UVB light. There was no statistically significant difference between the techniques in the proportion of patients with at least a 75% reduction in psoriasis. The pooled odds ratio was 3.48 (95% confidence interval, 0.56 to 22.84).

Mudigonda et al (2012) published a systematic review of controlled studies (RCTs and non-RCTs) on targeted vs nontargeted phototherapy for patients with localized psoriasis. Reviewers identified 3 prospective nonrandomized studies comparing the 308-nm excimer laser with NB-UVB. Among these studies was a study by Goldinger et al (2006) that compared the excimer laser with full-body NB-UVB in 16 patients. At the end of 20 treatments, PASI scores were equally reduced on the 2 sides, from a baseline of 11.8 to 6.3 for laser and from 11.8 to 6.9 for nontargeted NB-UVB. A study by Kollner et al (2005) included 15 patients with stable plaque psoriasis. The study compared the 308-nm laser, the 308-nm excimer lamp, and standard TL-01 lamps. One psoriatic lesion per patient was treated with each therapy (ie, each patient received all three treatments). Investigators found no significant differences in the efficacy of the three treatments after ten weeks. The mean number of treatments to achieve clearance of lesions was 24.

Section Summary: Moderate-to-Severe Localized Psoriasis
Systematic reviews of small RCTs and non-RCTs in patients with moderate-to-severe psoriasis have found that targeted phototherapy has efficacy similar to whole body phototherapy or PUVA. Targeted phototherapy is presumed to be safer
or at least no riskier than whole body phototherapy, due to risks of exposing the entire skin to the carcinogenic effects of UVB light.

**Psoralen Plus Ultraviolet A for generalized psoriasis**

**Clinical Context and Therapy Purpose**
The purpose of PUVA is to provide a treatment option that is an alternative to or an improvement on existing therapies in patients with generalized psoriasis.

The question addressed in this evidence review is: Does the use of PUVA improve the net health outcome in patients with localized or generalized psoriasis?

The following PICOTS were used to select literature to inform this review.

**Patients**
The relevant population of interest are individuals with generalized psoriasis.

**Interventions**
The therapy being considered is PUVA.

**Comparators**
The following therapies are currently being used to treat generalized psoriasis: topical medications and ultraviolet B light box therapy.

**Outcomes**
The general outcomes of interest are symptoms, change in disease status, quality of life, and treatment-related morbidity.

**Timing**
Though not completely standardized, follow-up for generalized psoriasis symptoms would typically occur in the months to years after starting treatment.

**Setting**
Patients with generalized psoriasis are actively managed by dermatologists and primary care providers in an outpatient setting.

**Study Selection Criteria**
Methodologically credible studies were selected using the principles outlined in indication 1.

**Systematic Reviews and Randomized Controlled Trials**
A number of RCTs and systematic reviews of RCTs have compared PUVA with other light therapies or with placebo. A Cochrane review by Chen et al (2013) assessed light therapy for psoriasis. However, that review is less useful for this evidence evaluation because reviewers combined results of studies using PUVA and broadband UVB, rather than reporting outcomes separately for these treatment modalities.
**PUVA vs NB-UVB**

An industry-sponsored systematic review by Archieret al (2012) focused on studies comparing PUVA with NB-UVB in patients who had chronic plaque psoriasis. Pooled analysis of 3 RCTs found a significantly higher psoriasis clearance with PUVA than with NB-UVB (odds ratio=2.79; 95% confidence interval, 1.40 to 5.55). In addition, significantly more patients remained cleared at 6 months with PUVA than with NB-UVB (odds ratio=2.73; 95% confidence interval, 1.18 to 6.27).

**PUVA vs Topical Steroids**

Amirnia et al (2012) published a trial in which 88 patients with moderate plaque psoriasis were randomized to PUVA or topical steroids. Treatment was continued for four months or until clearance was achieved. Clearance was defined as disappearance of at least 90% of baseline lesions. All patients in both groups achieved clearance within the four-month treatment period. Recurrence (defined as a resurgence of at least 50% of the baseline lesions) was reported significantly more often in the topical steroid group (9/44 [20.5%]) than in the PUVA group (3/44 [6.8%]; p=0.007) (see Table 1).

**PUVA vs UVA Without Psoralens**

El-Mofty et al (2014) published an RCT comparing PUVA with broadband-UVA in 61 patients who had psoriasis affecting at least 30% body surface area. Clinical outcomes were significantly better in the PUVA group than in the broadband-UVA groups (see Table 1). For example, complete clearance was obtained by 23 (77%) of 30 patients in the PUVA group, 5 (31%) of 16 patients in the 10 J/cm² UVA group, and 5 (33%) of 15 patients in the 15 J/cm² UVA group (p=0.020).

Sivanesan et al (2009) published a double-blind RCT evaluating the efficacy of 8-methoxypsoralen PUVA treatment in patients with moderate-to-severe psoriasis affecting at least 10% body surface area. The trial included 40 patients randomized to PUVA (n=30) and or UVA plus placebo psoralens (n=10). Patients were treated 3 times weekly for 12 weeks. The primary outcome was a 75% or greater improvement in PASI 75 score. At 12 weeks, 19 (63%) of 30 patients in the PUVA group and 0 (0%) of 10 patients in the UVA plus placebo group achieved the primary outcome measure (p<0.001) (see Table 1). There were no serious adverse events.

**Table 1. Summary of Individual RCTs of PUVA vs Other Light Treatments**

<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention Modality</th>
<th>No. of Participants</th>
<th>PUVA Effectiveness</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>El-Mofty et al (2014)</td>
<td>PUVA vs UVA without psoralens</td>
<td>61</td>
<td>Complete clearance obtained by 77% of PUVA group vs 31% and 33% of UVA-only groups</td>
<td>0.020</td>
</tr>
<tr>
<td>Amirinia et al (2012)</td>
<td>PUVA vs topical steroids</td>
<td>88</td>
<td>Recurrence reported significantly more often in topical steroid group than PUVA group</td>
<td>0.007</td>
</tr>
<tr>
<td>Sivanesan et al (2009)</td>
<td>PUVA vs UVA without psoralens</td>
<td>40</td>
<td>63% of PUVA group had ≥75% improvement in PASI 75 score at 12 wk vs 0% of UVA plus placebo group</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

PASI: Psoriasis Area Severity Index; PUVA: psoralen plus ultraviolet A; RCT: randomized controlled trials; UVA: ultraviolet A.
**Section Summary: Psoralen Plus UVA**

RCTs and systematic reviews of RCTs have found that PUVA is more effective than NB-UVB, topical steroids, or UVA without psoralens in patients with moderate-to-severe psoriasis. Due to side effects, PUVA is typically restricted to more severe cases.

**Summary of Evidence**

For individuals who have mild localized psoriasis who receive targeted phototherapy, there is little evidence. The relevant outcomes are symptoms, change in disease status, quality of life, and treatment-related morbidity. The evidence is lacking on the use of targeted phototherapy as first-line treatment of mild psoriasis. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have mild psoriasis that is resistant to topical medications who receive targeted phototherapy, the evidence includes small within-subject studies. The relevant outcomes are symptoms, change in disease status, quality of life, and treatment-related morbidity. The available pre-post studies have shown that targeted phototherapy can improve mild localized psoriasis (<10% body surface area) that has not responded to topical treatment. Targeted phototherapy is presumed to be safer or at least no riskier than whole body phototherapy, due to risks of exposing the entire skin to the carcinogenic effects of UVB light. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have moderate-to-severe localized psoriasis who receive targeted phototherapy, the evidence includes randomized controlled trials (RCTs) and systematic reviews of RCTs. The relevant outcomes are symptoms, change in disease status, quality of life, and treatment-related morbidity. Systematic reviews of small RCTs and non-RCTs in patients with moderate-to-severe psoriasis have found that targeted phototherapy has efficacy similar to whole body phototherapy and supports the use of targeted phototherapy for the treatment of moderate-to-severe psoriasis comprising less than 20% of body surface area for which narrowband UVB or phototherapy with PUVA are indicated. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have generalized psoriasis who receive PUVA, the evidence includes RCTs and systematic reviews. The relevant outcomes are symptoms, change in disease status, quality of life, and treatment-related morbidity. RCTs and systematic reviews of RCTs have found that PUVA is more effective than narrowband UVB, topical steroids, or ultraviolet A without psoralens in patients with generalized psoriasis. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

**SUPPLEMENTAL INFORMATION**
Practice Guidelines and Position Statements

American Academy of Dermatology
The American Academy of Dermatology (2010) guidelines on the management of psoriasis recommended that patients with psoriasis who are compliant could, under dermatologist supervision, be considered appropriate candidates for home ultraviolet B therapy.\(^4\) Targeted phototherapy was recommended for patients with mild, moderate, or severe psoriasis with less than 10% involvement of the body surface area. Systemic psoralen plus ultraviolet A was indicated in adults with generalized psoriasis resistant to topical therapy.

National Psoriasis Foundation
The National Psoriasis Foundation (2017) published a consensus guidance based on a task force review of the literature on the treatment for psoriasis involving skinfolds (inverse or intertriginous) psoriasis.\(^{17}\) The treatment guidance for intertriginous or genital psoriasis stated: “...there is anecdotal evidence demonstrating the strong clinical efficacy of biologic treatment; with limited knowledge on the effects of biologics on intertriginous or genital psoriasis.” The guidance on inverse psoriasis is provided in Table 2.

Table 2. Recommendations on Treatment of Inverse Psoriasis

<table>
<thead>
<tr>
<th>Line of Therapy</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td>First-line therapy</td>
<td>Low potency topical steroids for periods less than 2-4wks</td>
</tr>
<tr>
<td></td>
<td>Other topical therapies to consider are tacrolimus, pimecrolimus, calcitriol, or calcipotriene to avoid steroid side effects with long-term treatment</td>
</tr>
<tr>
<td>Second- and third-line therapies</td>
<td>Antimicrobial therapy, emollients, and tar-based products</td>
</tr>
<tr>
<td></td>
<td>Axillary involvement can be treated with botulinum toxin injection to reduce perspiration and inhibit inflammatory substance release</td>
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<tr>
<td></td>
<td>Excimer laser therapy or systemic agents</td>
</tr>
</tbody>
</table>

The National Psoriasis Foundation (2017) also published recommendations based on a review of the literature on the treatment for psoriasis in solid organ transplant patients.\(^{18}\) Because organ transplant patients are excluded from randomized controlled trials, there are limited data. The recommendations were based on case series (see Table 3).

Table 3. Recommendations on Treatment of Psoriasis for Solid Organ Transplant Patients

<table>
<thead>
<tr>
<th>Line of Therapy</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td>First-line therapy for mild-to-moderate psoriasis</td>
<td>Topical therapy</td>
</tr>
<tr>
<td>First-line therapy for moderate-to-severe psoriasis</td>
<td>• Acitretin with narrowband ultraviolet light or&lt;br&gt;• Narrowband ultraviolet light or&lt;br&gt;• Acitretin</td>
</tr>
<tr>
<td>Second-line therapy</td>
<td>Increasing the current anti-rejection drug dose</td>
</tr>
<tr>
<td>Severe psoriasis or refractory cases</td>
<td>Systemic or biologic therapies</td>
</tr>
</tbody>
</table>

U.S. Preventive Services Task Force Recommendations
Not applicable.
Medicare National Coverage
Ultraviolet light treatment is covered; targeted phototherapy is not specifically mentioned. There is no national coverage determination on psoralen plus ultraviolet A.

Ongoing and Unpublished Clinical Trials
Some currently unpublished trials that might influence this review are listed in Table 4.

Table 4. Summary of Key Trials

<table>
<thead>
<tr>
<th>NCT No.</th>
<th>Trial Name</th>
<th>Planned Enrollment</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCT03180866&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Evaluation of Efficacy, Duration of Remission and Safety of a Light and Occlusive Patch Therapy for Plaque Psoriasis</td>
<td>32</td>
<td>Mar 2018 (ongoing)</td>
</tr>
<tr>
<td>NCT02999776&lt;sup&gt;a&lt;/sup&gt;</td>
<td>An Observer Partially-blinded, Lesion-randomized, Intra-patient Controlled, 3-arm, Phase I Study to Assess Safety and Efficacy of Laser-assisted Topical Etanercept Administration in Patients With Mild to Moderate Plaque Psoriasis</td>
<td>30</td>
<td>Jun 2018 (ongoing)</td>
</tr>
<tr>
<td>NCT02294981&lt;sup&gt;a&lt;/sup&gt;</td>
<td>A Randomized Clinical Trial to Determine Whether a Novel Plaque-based Dosimetry Strategy Can Improve the Speed of Response to Treatment in Patients With Plaque Psoriasis (Photos)</td>
<td>30</td>
<td>Jun 2017 (unknown)</td>
</tr>
<tr>
<td>NCT02735187&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Monocenter, Randomized, Blinded, Intraindividual Study Evaluating Efficacy and Safety of Blue Light (453 nm) Treatment for Mild Psoriasis Vulgaris Over Three Months Compared to Vitamin D</td>
<td>50</td>
<td>Aug 2016 (completed)</td>
</tr>
</tbody>
</table>

NCT: national clinical trial.
<sup>a</sup> Denotes industry-sponsored or cosponsored trial.

REFERENCES


Eczema


Billing Coding/Physician Documentation Information

96900 Actinotherapy (ultraviolet light)
96912 Photochemotherapy; psoralens and ultraviolet A (PUVA)
96913 Photochemotherapy (Goeckerman and/or PUVA) for severe photoresponsive dermatoses requiring at least 4-8 hours of care under direct supervision of the physician (includes application of medication and dressings)
96920 Laser treatment for inflammatory skin disease (psoriasis); total area less than 250 sq cm
96921 Laser treatment for inflammatory skin disease (psoriasis); 250 sq cm to 500 sq cm
96922 Laser treatment for inflammatory skin disease (psoriasis); over 500 sq cm
J8999 Prescription drug, oral, chemotherapeutic, not otherwise specified

**ICD10 Codes**

L23.0- Allergic contact dermatitis code range
L23.7
L23.81- Allergic contact dermatitis code range
L23.9
L24 Irritant contact dermatitis
L24.1 Irritant contact dermatitis due to oils and greases
L24.3 Irritant contact dermatitis due to cosmetics
L24.4 Irritant contact dermatitis due to drugs in contact with skin
L24.5 Irritant contact dermatitis due to other chemical products
L24.6 Irritant contact dermatitis due to food in contact with skin
L24.7 Irritant contact dermatitis due to plants, except food
L24.81 Irritant contact dermatitis due to metals
L24.89 Irritant contact dermatitis due to other agents
L24.9 Irritant contact dermatitis, unspecified cause
L25.0 Unspecified contact dermatitis due to cosmetics
L25.1 Unspecified contact dermatitis due to drugs in contact with skin
L25.2 Unspecified contact dermatitis due to dyes
L25.4 Unspecified contact dermatitis due to food in contact with skin
L25.5 Unspecified contact dermatitis due to plants, except food
L25.8 Unspecified contact dermatitis due to other agents
L25.9 Unspecified contact dermatitis, unspecified cause
L30.0 Nummular dermatitis
L30.2 Cutaneous autosensitization
L30.8 Other specified dermatitis
L30.9 Dermatitis, unspecified
L40.0- Psoriasis code range
L40.9
L41.0 Pityriasis lichenoides et varioliformis acuta
L41.1 Pityriasis lichenoides chronica
L41.3 Small plaque parapsoriasis
L41.4 Large plaque parapsoriasis
L41.5 Retiform parapsoriasis
L41.8 Other parapsoriasis
L41.9 Parapsoriasis, unspecified
L42 Pityriasis rosea
L44 Other papulosquamous disorders
L55.0 Sunburn of first degree
L55.1 Sunburn of second degree
L55.2 Sunburn of third degree
L55.9 Sunburn, unspecified
L56.1 Drug photoallergic response
L56.2 Photocontact dermatitis [berloque dermatitis]
L56.3 Solar urticaria
L56.4 Polymorphous light eruption
L56.5 Disseminated superficial actinic porokeratosis (DSAP)
In 2002, CPT established separate codes (96920-96922) that describe ultraviolet light laser treatment for inflammatory disease (psoriasis) according to the surface area of skin treated (total area less than 250 sq cm, 250 sq cm-500 sq cm, over 500 sq cm).

The laser treatment codes are distinct from codes that describe the dermatological use of ultraviolet light, also known as actinotherapy (96900), and photochemotherapy (96910-96913).

**Additional Policy Key Words**

N/A

**Policy Implementation/Update Information**

5/1/06 New policy titled *Xenon Chloride Excimer Laser Therapy for Phototherapeutic Treatment of Psoriasis*; considered investigational.

12/1/06 Policy statement revised to include medically necessary indications. Policy title changed to *Targeted Phototherapy for Psoriasis*.

5/1/07 No policy statement changes.

5/1/08 Policy statement revised to include medically necessary indications for eczema.

5/1/09 No policy statement changes.

5/1/10 No policy statement changes.

5/1/11 No policy statement changes.

5/1/12 Scope of policy changed to include PUVA for psoriasis. Policy title changed to “Light Therapy for Psoriasis.” Policy statement added that PUVA may be considered medically necessary for the treatment of severe, disabling psoriasis, which is not responsive to other forms of conservative therapy. “Localized” added to second policy statement on targeted phototherapy. Archived Policy 2.01.07 – Psoralens with
Ultraviolet A (PUVA) in Psoriasis
5/1/13 No policy statement changes.
5/1/14 No policy statement changes.
5/1/15 No policy statement changes.
5/1/16 No policy statement changes.
5/1/17 No policy statement changes.
5/1/18 No policy statement changes.
5/1/19 No policy statement changes.

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