THE PSORIASIS AND PSORIATIC ARTHRITIS POCKET GUIDE

Treatment algorithms and management options

www.psoriasis.org

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This is the third edition of the *Psoriasis and Psoriatic Arthritis Pocket Guide: Treatment Algorithms and Management Options*. The previous editions were well received by dermatologists. Since the publication of the second edition, many new psoriasis treatments—particularly biologics—have become available. The original work was revised to provide guidance for managing patients with moderate-to-severe psoriasis, and to put the role of new biologics into perspective.

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**CHAPTER 1: INTRODUCTION**

**Epidemiology**
Psoriasis affects approximately 2.1% of U.S. adults, up to 7.5 million people, of whom about 30% will develop psoriatic arthritis. Approximately 1.5 million U.S. adults are considered to have moderate to severe psoriasis and between 150,000 and 260,000 new cases of psoriasis are diagnosed each year.1-3

Although there is evidence that psoriasis may be more prevalent in women than men, psoriasis affects all ages, genders, races and ethnicities. The majority of patients will present before the age of 35 with their first signs and symptoms of psoriasis. From an economic standpoint, an estimated 56 million hours of work are lost each year by people with psoriasis.

In addition, approximately $11.25 billion are spent annually treating the disease.4 The costs are greater for those with more severe disease, and these financial implications are associated with a lower quality of life.5 These costs are more than those of other lifelong illnesses, such as emphysema and epilepsy.6

**Psoriasis: A Systemic Disease**
Psoriasis is a systemic, immunological, genetic disease manifesting in the skin and/or joints. Because of its systemic nature, patients exhibit a broad spectrum of symptoms that vary in severity. Although many patients, particularly those...
with the limited form of the disease, may be treated with topical therapy, those with extensive (moderate to severe) psoriasis eventually require phototherapy, systemic or biologic therapy to adequately suppress the systemic, immunopathogenic process.

Psoriasis may be defined based purely on body surface area (BSA) with 0-3% BSA = mild, 3-10% BSA = moderate, and greater than 10% BSA = severe. Others define it as limited, less than 3% BSA, or, extensive, greater than 3% BSA. In clinical trials, severe psoriasis is defined as the presence of lesions over more than 10% BSA. These definitions however do not take into consideration the impact on the patient’s quality of life.

How do physicians define severity of psoriasis? In clinical practice, the definition of severity is based more on the physician’s judgment and assessment of the extent of the disease, specific locations involved, and the effect of the disease on the patient’s life. In severe psoriasis, and in many cases of moderate psoriasis, systemic therapies are used to treat the disease effectively. Involvement of localized areas such as the hands, face and scalp (less than 3% BSA), as well as the emotional impact on the patient, may certainly be of sufficient magnitude to warrant systemic therapy.

**Psoriasis Negatively Affects Quality of Life**

Psoriasis is a lifelong, chronic, recurrent disease. In patient surveys conducted between 2001 and 2008 by the National Psoriasis Foundation, 33% of patients with mild disease and 60% of patients with moderate-to-severe reported that their disease was a significant problem in their everyday life. Psoriasis can be as debilitating as many other serious medical or psychiatric conditions. The negative effect on the physical, psychological and social dimensions of life can be greater than those resulting from life-threatening illnesses such as myocardial infarction.

![Figure 1-1: Physical and Mental Rankings of Psoriasis and Other Diseases, From Best Functioning (1) to Worst Functioning (11)](image)

**Comorbidities in Psoriasis**

While psoriasis has traditionally been considered a disease of the skin and/or the joints, multiple reports attest to the important role of systemic inflammation with ramifications for other organ systems, including the cardiovascular, liver, respiratory and hematological systems. Thus patients, particularly
those with more severe disease, may be at increased risk for coronary artery disease, type II diabetes, fatty liver and its consequences, stroke, COPD, sleep apnea, and lymphoma. In addition, there is well-documented evidence for an increase in depression, with resulting personal behavior issues such as an increase in alcohol consumption and smoking.

Finally, other important autoimmune diseases such as Crohn’s disease, diabetes mellitus, and even multiple sclerosis may be genetically linked to psoriasis and hence seen in increased frequency in psoriasis patients.

It is therefore important for all patients with psoriasis to be evaluated for these comorbid conditions and for dermatologists to play a central role in consultation with primary care physicians and other specialists in elucidating the medical consequences of this autoimmune disease.

**Differential Diagnosis**
A number of important dermatoses, including fungal infections, mycosis fungoides (MF) and drug eruptions, may mimic psoriasis. Chapter 2 includes a full differential diagnosis section relating to this problem.

**Systemic Therapy: Going Beyond Topicals**
It is medically appropriate to use systemic therapies, alone or in combination with topicals and phototherapy, in patients who do not meet the criteria for moderate-to-severe psoriasis if:

- The patient is unresponsive to topicals and other therapies;
- Phototherapy is inconvenient or impractical;
- The patient’s quality of life is negatively affected to a degree that justifies the potential adverse effects of systemic therapy.

The decision to use systemic therapy requires an important discussion between the patient, the physician and his/her support staff. (See Figure 1-2.) For more information regarding systemic therapy visit [www.psoriasis.org/severe/systemics](http://www.psoriasis.org/severe/systemics).
Currently, many therapeutic options are available to physicians treating psoriasis patients, including targeted immunologic therapies (biologics). In addition, there are various treatment strategies that can be used (discussed in Chapter 3) employing combination, rotation and sequential therapies. Treating a chronic immunologic disease such as psoriasis can be difficult for both patient and physician. This handbook is designed to facilitate successful treatment. To help you choose therapies, we have included suggested patient algorithms in Chapter 4, allowing quick reference to a variety of patient types, recommended treatments, side effects and management options. We have also suggested treatment sequences. The therapies reviewed in Chapter 4 vary in the seriousness of their side effects, which are always to be weighed in the balance when you consider using a course of therapy.

**How Much, How Often and at What Dose?**

Once you have chosen a treatment strategy, you must consider dosing, side effects, length of treatment and overall patient management, especially if the strategy includes switching from one systemic treatment to the next, as in sequential therapy.

Chapters 5 and 6 discuss each of these points relative to the therapies outlined in the patient algorithms. These chapters also discuss clinical pearls and transitional issues related to the systemic therapies.

**Treating Patients in Practice**

Patients should be fully educated about all aspects of their disease, including all potential systemic-related disorders and a specific, personalized treatment plan developed for that patient.

---

*Phototherapy can be used for the treatment of psoriasis skin lesions in patients with psoriatic arthritis, but these patients also require systemic treatment for the joint involvement.*
Objectives
After studying this handbook, you should be able to:

- Define the severity of psoriasis and develop an appropriate therapy plan.
- Explain the profound emotional, social and physical impact psoriasis has on the patient.
- Understand the important comorbidities associated with psoriasis.
- Differentiate psoriasis from other diseases when you evaluate patients who present with similar types of skin lesions.
- Diagnose patients who have moderate disease (3% to 10% body involvement) and severe disease (>10% body involvement or <10% involvement but resistant to topical therapy) and identify those who will potentially benefit from systemic therapy.
- Discuss therapeutic options and appropriate doses for patients at various stages of severity.
- Describe toxicities expected with various therapies and ways to minimize and manage them.
CHAPTER 2: ASSESSING A PSORIASIS PATIENT

Clinical Presentation
The clinical manifestations of psoriasis are well-known and are usually recognized easily, although presentation and the location of the psoriasis may vary at different stages of the disease.12 (See Table 2-1.)

Table 2-1: The Most Common Locations of Lesions in Patients With Psoriasis

<table>
<thead>
<tr>
<th>Location</th>
<th>% of Psoriasis Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalp</td>
<td>80</td>
</tr>
<tr>
<td>Elbows</td>
<td>78</td>
</tr>
<tr>
<td>Legs</td>
<td>74</td>
</tr>
<tr>
<td>Knees</td>
<td>57</td>
</tr>
<tr>
<td>Arms</td>
<td>54</td>
</tr>
<tr>
<td>Trunk</td>
<td>53</td>
</tr>
<tr>
<td>Lower part of the body</td>
<td>47</td>
</tr>
<tr>
<td>Base of the back</td>
<td>38</td>
</tr>
<tr>
<td>Other</td>
<td>38</td>
</tr>
<tr>
<td>Palms and soles</td>
<td>12</td>
</tr>
</tbody>
</table>

Adapted from van de Kerkhof13

Chronic plaque-type disease is the most common form of psoriasis, being present in 80% to 90% of patients. It is most often found on the elbows, knees, scalp, legs and sacrum.

Erythroderma, especially of recent onset, is often associated with psoriasis but may be difficult to differentiate from other possible causes of erythrodermic or exfoliative dermatitis. Patients may present with systemic symptoms and abnormal laboratory values.
Pustular psoriasis is of two types. Patients with pustules localized to the palms and soles have palmoplantar psoriasis; patients with generalized pustulosis have the von Zumbusch form of psoriasis, usually in association with erythroderma.

Less common forms include guttate, which is characterized by numerous small, drop-like lesions frequently following a throat infection, and occurs most often in children; and inverse or intertriginous, which is a seborrheic-dermatitis-like form of psoriasis in which moist erythematous lesions appear in skin folds of the body (e.g., the armpit, under the breast, the buttocks or genitals).

**Initial Work-up**
A total body evaluation, including the nails and scalp, should be performed at the first visit. Patients should be routinely asked about joint symptoms, which might be indicative of psoriatic arthritis. In addition, factors relating to the clinical presentation should be discussed with the patient. (See Table 2-2.)

<table>
<thead>
<tr>
<th>Table 2-2: Discussion Points for M.D./Patient on Initial Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Symptoms/lesions/diagnosis</td>
</tr>
<tr>
<td>• Hereditary aspect</td>
</tr>
<tr>
<td>• Systemic manifestations</td>
</tr>
<tr>
<td>• Exacerbating factors</td>
</tr>
<tr>
<td>• Ameliorating factors</td>
</tr>
<tr>
<td>• Past treatment responses</td>
</tr>
<tr>
<td>• Range of therapeutic options</td>
</tr>
<tr>
<td>• Chronic long-term disease</td>
</tr>
<tr>
<td>• Psychological ramifications</td>
</tr>
<tr>
<td>• Optimism for tomorrow</td>
</tr>
<tr>
<td>• Support/services available from the National Psoriasis Foundation</td>
</tr>
</tbody>
</table>

*Adapted from Menter and Weinstein*<sup>12</sup>

**Determining Disease Severity**
The severity of psoriasis is determined by measuring the percent of BSA affected, determining the location of lesions and considering other factors such as the effect of psoriasis on the patient’s quality of life and ability to function. (See Table 2-3.) Psoriasis involving the palms and soles may be considered severe.

<table>
<thead>
<tr>
<th>Table 2-3: Severity of Psoriasis and Percent of Body Surface Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Severity</strong></td>
</tr>
<tr>
<td>Mild</td>
</tr>
<tr>
<td>Moderate</td>
</tr>
<tr>
<td>Severe</td>
</tr>
</tbody>
</table>
Assessing a Patient
Psoriasis has traditionally been classified as mild, moderate or severe. As shown in Figure 2-1, about 65% of patients have mild disease and about 35% have moderate to severe disease.\textsuperscript{1-3} The National Psoriasis Foundation defines moderate to severe disease not only in terms of BSA (>3%) but also includes patients with a BSA of < 3% who are being treated with a systemic medication or with phototherapy.

For practical treatment purposes, it is helpful to define psoriasis as either limited (BSA <3%) or extensive (BSA >3%). Extensive psoriasis (as well as palmoplantar psoriasis) generally cannot be treated with topical treatments alone. Patients with extensive psoriasis are candidates for phototherapy and/or systemic treatment.

Measuring BSA
The patient’s hand, including the palm, fingers and thumb, is used as the reference point for measuring how much of their skin is affected by psoriasis, representing roughly 1% of the body’s surface.

- **Mild psoriasis:** Affects up to 3% of the body, generally in isolated patches on the knees, elbows, scalp, hands and feet. It can often be controlled with topical therapy.

- **Moderate psoriasis:** Affects 3% to 10% of the body’s surface. It often appears on the arms, legs, torso, scalp and other areas. Topical agents, phototherapy, systemic medications, including biologics, may be appropriate.

- **Severe psoriasis:** Affects >10% of the body. It may be extensive with plaques, pustules or erythroderma. Phototherapy, systemic medications, including biologics or a combination of these, with or without a topical agent, are usually necessary to achieve adequate results.

**Quality of Life and Severity**
Disease severity classifications serve as a reference point for the physical aspects of the disease, but not the emotional and social aspects.\textsuperscript{14} Psoriasis can profoundly affect a person’s life and negatively affect his/her lifestyle, emotional well-being, social life and ability to work.

- Clinical assessment should include the patient’s perspective on subjective factors such as itching, pain, loss of sleep and effect on daily activities, as well as the clinician’s perspective.
A patient may have psoriasis that covers only a small area, but if it is highly visible or debilitating, it could be considered a severe case despite the small area involved.

The Koo-Menter Psoriasis Instrument (KMPI) was designed to be a practical assessment tool that dermatologists can use to aid in clinical decision-making and in documentation for third-party payers. The KMPI is short enough for the patient and the physician to quickly complete, with items that are simple and easy to understand and answer. At the same time, it is comprehensive enough to include a Validated Health Related Quality of Life (HRQOL) Index, a psoriasis Quality of Life index (PQOL-12) and other assessments from both the patient’s and the physician’s perspective. The patient completes one side (prior to being seen by the physician) and then the physician completes the other.

A copy of the KMPI instrument can be found on page 16. For additional copies, contact the National Psoriasis Foundation at education@psoriasis.org or call 503.244.7404.

Psoriasis Is as Debilitating as Other Major Diseases

The physical and mental functioning of patients with psoriasis is reported to be affected as much as that of patients with cancer, arthritis, hypertension, heart disease, diabetes and depression.8

- Physical- and mental-functioning scores for psoriasis patients are among the lowest of all groups (10/11 for physical and 9/11 for mental functioning, 11 representing the lowest functioning).8

- Burning sensations, joint pain and appearance were negative physical factors.

- Itching, skin soreness and the negative or dismissive attitude of their doctors regarding psoriasis negatively affected mental function.8

- "The physical and mental functioning of patients with psoriasis is reported to be affected as much as that of patients with cancer, arthritis, hypertension, heart disease, diabetes and depression."
### Part 1: Quality of Life
- **Please answer each of the following questions as they pertain to your psoriasis during the past month.**

#### (Circle one number per question)

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at All</th>
<th>Somewhat</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How self-conscious do you feel with regard to your psoriasis?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>2. How helpless do you feel with regard to your psoriasis?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>3. How embarrassed do you feel with regard to your psoriasis?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>4. How angry or frustrated do you feel with regard to your psoriasis?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>5. To what extent does your psoriasis make your appearance unsightly?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>6. How disfiguring is your psoriasis?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>7. How much does your psoriasis impact your overall emotional well-being?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>8. Overall, to what extent does your psoriasis interfere with your capacity to enjoy life?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>

#### How much has each of the following been affected by your psoriasis during the past month?

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at All</th>
<th>Somewhat</th>
<th>Very Much</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Itching?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>10. Physical irritation?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>11. Physical pain or soreness?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>12. Choice of clothing to conceal psoriasis?</td>
<td>0 1</td>
<td>2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>

**12-item Psoriasis Quality of Life Questionnaire (PQOL-12), Copyright © 2002, 2003, Allergan, Inc.**

**Total Quality-of-Life Score (0-120)**
(Medical staff to calculate)
Part 2:
A. Using the figures below, place an “X” on the parts of your body that currently have psoriasis.

K00-MENTER PSORIASIS INSTRUMENT
Physician Assessment

Part 1: Total Quality-of-Life assessment score (from part 1 of previous page)

Part 2: Area of Involvement: % BSA (body surface area)

Head
Anterior Trunk
Posterior Trunk
Right Leg
Left Leg
Both arms
Genitalia

Note: Patient’s open hand (from wrist to tips of fingers) with fingers tucked together and thumb tucked to the side equals approximately 1% body surface area

Total BSA

Part 3:
A. Have you ever been diagnosed with psoriatic arthritis? □ Yes □ No

B. Do you have swollen, tender, or stiff joints (e.g., hands, feet, hips, back)? □ Yes □ No

If yes, how many joints are affected? (Check one box)
1 □ 2 □ 3 □ 4 □ More than 4 □

If yes, how much have your joint symptoms affected your day-to-day activities?
Not at all □ A little □ A lot □ Very much □

Once completed, please return to medical staff
### Part 3: In terms of psoriasis severity, does the patient have:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaque, erythrodermic, or pustular psoriasis with &gt;10% BSA involvement?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guttate psoriasis?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Localized (&lt; 10% BSA) psoriasis but resistant to optimized attempts at topical therapy or physically disabling (e.g., palmoplantar psoriasis)?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Localized (&lt; 10% BSA) but serious subtype with possibility of progression (e.g., pustular or pre-erythrodermic psoriasis)?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Clinical evidence of psoriatic joint disease as assessed by physician (e.g., examine IP, MCP and MT joints of hands, wrists, feet and ankles, plus patient responses from Part 3 of patient self-assessment)?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Substantial psychosocial or quality-of-life impact documented by patient Quality-of-Life self-assessment score of ≥50?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

### Part 4: Is phototherapy an option?

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is a suitable phototherapy unit readily accessible to the patient?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the anatomical location or form of psoriasis (e.g., scalp, inverse, erythrodermic) preclude phototherapy?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Does the patient have the dedication, time, stamina, or transportation for phototherapy?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Has phototherapy, as monotherapy, failed in the past?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Is phototherapy contraindicated (e.g., photosensitive drugs, history of multiple skin cancers)?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>In your clinical judgment, is phototherapy likely to yield substantial improvement to justify its use before systemic therapy?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
If at least one of the shaded boxes in both Part 3 and Part 4 on the previous page are checked, then the patient is a candidate for systemic therapy.

Conclusion: The patient is a candidate for systemic therapy.

Yes  No
These results suggest that physicians planning treatment options should consider psychological and social aspects of the disease, as well as the physical aspects (e.g., severity of skin lesions and the possibility of associated joint disease).

**Psoriasis Affects Social and Economic Well-being**

In a mail survey conducted by the Psoriasis Foundation, patients were asked to assess the effects of psoriasis on their lifestyle, emotional well-being and social interactions with others. The following problems were identified in this survey:

- Difficulty finding a job
- Job complications (e.g., 2.3 days/year were missed due to psoriasis)
- Financial distress (reported by about one-third of respondents)
- Suicide contemplation
- Sexual activity concerns
- Embarrassment when people saw their psoriasis (81% of respondents); frustration with ineffective treatments (90%); feeling unattractive (75%); depression (54%)

In a 2002 study conducted by the Psoriasis Foundation, patients with moderate to severe psoriasis said that their disease affected their quality of life in the following ways:

- 26% had to alter or stop their normal daily activities.
- 40% chose clothing to cover up their condition.
- 36% had problems with sleep.

These studies confirm the major impact that psoriasis has on patients’ lives. Physicians must recognize this impact and work with their patients to control both the disease and all the sequelae.

**Types of Psoriasis**

A patient’s psoriasis may present in varying degrees of severity during the course of the disease. Individual lesions may range from pinpoint lesions to large plaques. The size of the lesions helps determine the psoriasis type.

**Plaque psoriasis** is the most common type of psoriasis.

- Diagnosed in 80% to 90% of patients
- Characterized by sharply defined erythematous plaques that are distributed somewhat symmetrically
- Most commonly seen on the scalp
- Coin-sized to palm-sized plaques, usually present for months to years. Lesions larger than palm-sized are often due to coalescence of individual plaques, as seen in geographic psoriasis.
• Nail involvement in up to 55% of patients, with findings such as pitting, onycholysis, subungual hyperkeratosis and “oil drops.”

**Erythrodermic psoriasis** consists of inflammation of the skin with replacement of the skin surface by generalized erythema, scaling and exfoliation. This type is sometimes called exfoliative psoriasis.

• It is diagnosed in about 10% of patients at certain times in their lifetime; repeated episodes are not uncommon.

• Patients may be ill and have hypo- or hyperthermia, protein loss, dehydration, renal failure and cardiac abnormalities. Death may occasionally ensue. Gross nail deformations are frequent.

• Previous history with signs of psoriasis and skin biopsy is helpful in the differential diagnosis (e.g., eczema, Sezary’s syndrome, pityriasis rubra pilaris [PRP], etc.).

• It may occur at any age.

**Pustular psoriasis** is characterized by individual or coalescing sterile pustules.

• When inflammatory processes dominate, patients may develop either generalized (von Zumbusch psoriasis) or localized pustules, most often on the palms or soles (palmoplantar).

• Pustular palmoplantar psoriasis occurs in less than 5% of patients, often presenting with erythematous, scaly plaques with pustules on palms and soles. Pustules vary in size from 1 mm to 1 cm and are yellow at first, turning to brown.

• Pustular psoriasis, seldom seen in children, affects mostly the elderly. Only 12% of patients develop it before age 60. Between 70% and 90% of patients are female; 10% to 25% have a positive family history.

• Generalized forms of the disease (e.g., von Zumbusch), though uncommon, are frequently associated with arthritis and a stormy course of disease.

**Guttate psoriasis** is characterized by mostly small papules of short duration (weeks to months).

• It usually affects children and young adults.

• Many patients suffer from an infection before the lesions appear, particularly an upper respiratory infection, commonly of the streptococcal variety.

• “Droplet” lesions occur over the entire body surface. The trunk is most commonly affected with the palms and soles usually being spared.

**Inverse/flexural psoriasis** is a seborrheic-dermatitis-like form that occurs in the armpit, under the breast and in skin folds around the groin, buttocks and genitals.
Nail and Mucosal Manifestations of Psoriasis

- Both the nail bed (onycholysis, yellowish discoloration and/or hyperkeratosis) and the nail matrix (pitting) can be observed in psoriasis.\(^\text{13}\)

  - Fingernails are more often involved than toenails. Most patients with psoriatic arthritis have co-existent nail involvement. About half of these patients have pain and are restricted in their daily activities because of nail changes.

  - About 50% of all patients with psoriasis have nail involvement.

- Lesions can occur on mucosal membranes, including the geographic tongue in psoriasis patients.

Various factors that may trigger or exacerbate psoriasis are listed in Table 2-4.

Table 2-4: Triggers for Psoriasis

- Stress
- Winter weather
- Physical trauma to the skin
- Phototoxic reactions (solar, UVB or PUVA induced)
- Activation of local cellular immunity by allergens, infections and immunizations
- Systemic immunological activation or alteration (e.g. hypersensitivity to a drug or other antigen such as Group A streptococcal or HIV infection
- Drugs (e.g. corticosteroids, lithium, antimalarials, beta-blockers, nonsteroidal anti-inflammatory drugs, angiotensin converting enzyme inhibitors)

Adapted from Menter and Weinstein\(^\text{12}\)
Psoriatic Arthritis

- Joints are affected in as many as 30% of patients with psoriasis. Psoriasis of the joints is called psoriatic arthritis (PSA) and is characterized by inflammation and stiffness in the soft tissue around the joints. There are five clinical subtypes of joint involvement, and the fingers and toes are frequently involved (Table 2-5).  

- Assessing joint signs and symptoms is a key component of evaluating psoriasis patients. Skin lesions of psoriasis tend to occur before joint symptoms. Moreover, joint involvement can cause irreversible damage to the joint, so early recognition and treatment is important.

Finally, the presence or absence of joint involvement may help determine whether systemic treatments are used to control the disease.

PASE Questionnaire

Complications of psoriatic arthritis can be prevented with early diagnoses and appropriate treatment. The Psoriatic Arthritis Screening and Evaluation (PASE) questionnaire was developed using standardized methodology using both functional and health-related instruments focused on musculoskeletal disease.

The Psoriatic Arthritis Screening and Evaluation tool is included in this pocket guide, page 32. It is a validated patient self-administered tool to help screen psoriasis patients for the signs and symptoms of psoriatic arthritis.

Table 2-5: Five Types of Psoriatic Arthritis (PSA)

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symmetric arthritis</td>
<td>Affects about 15% of PSA patients. Involves multiple symmetric pairs of joints in the hands and feet; resembles rheumatoid arthritis.</td>
</tr>
<tr>
<td>Asymmetric arthritis</td>
<td>The most common type of PSA, found in about 80% of patients. Usually involves only 1-3 joints in an asymmetric pattern and may affect any joint (e.g. knee, hip, ankle, and wrist). Hands and feet may have enlarged “sausage” digits.</td>
</tr>
<tr>
<td>Distal interphalangeal predominant [DIP]</td>
<td>This “classic type” occurs in only about 5% of PSA patients. Primarily involves distal joints of the fingers and toes. It is sometimes confused with osteoarthritis, but nail changes are common.</td>
</tr>
<tr>
<td>Spondylitis</td>
<td>Inflammation of the spinal column causing a stiff neck and pain in the lower back and sacroiliac area. Peripheral disease may be seen in the hands, arms, hips, legs and feet.</td>
</tr>
<tr>
<td>Arthritis mutilans</td>
<td>A severe, deforming type of PSA affecting &lt;5% of patients with PSA. Usually affects a few joints in the hands and feet. Has been associated with pustular psoriasis.</td>
</tr>
</tbody>
</table>
**PSORIATIC ARTHRITIS SCREENING AND EVALUATION (PASE) QUESTIONNAIRE**

Please circle or mark **ONLY ONE** of the answers to the following questions. The answers to these questions will help us better understand your symptoms. This should take about 5-6 minutes to complete. Thank you for your time.

### A. Have you ever been diagnosed with psoriatic arthritis by a rheumatologist?

<table>
<thead>
<tr>
<th>YOUR SYMPTOMS</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel tired during most of the day.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2. My joints hurt.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3. My back hurts.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4. My joints become swollen.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5. My joints feel “hot.”</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6. Occasionally, my entire finger or toe becomes swollen, making it look like a “sausage.”</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7. I have noticed that the pain in my joints moves from one joint to another. For example, my wrist will hurt for a few days, then my knee will hurt, and so on.</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total Symptom Score**

### YOUR ABILITY TO DO DAILY ACTIVITIES

<table>
<thead>
<tr>
<th>YOUR ABILITY TO DO DAILY ACTIVITIES</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>No Opinion</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. I feel that my joint problems have affected my ability to work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. My joint problems have affected my ability to care for myself (for example, getting dressed or brushing my teeth).</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I have had trouble wearing my watch or wearing rings on my fingers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I have had trouble getting into or out of a car.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I am unable to be as active as I used to be.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I feel stiff for more than 2 hours after waking up in the morning.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. The morning is the worst time of day for me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. It takes me a few minutes to get moving as well as I can, at any time of the day.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total Function Score**

**Total PASE Score**
PASE design and scoring system

PASE is composed of 15 items scored on a five-point scale. The scale ranges from ’Strongly Agree’ to ’Strongly Disagree’ (Table 1).

<table>
<thead>
<tr>
<th>TABLE 1: Five-point scale scoring system</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
</tr>
<tr>
<td>Neutral</td>
<td>3</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
</tr>
<tr>
<td>Item left blank or unanswered</td>
<td>0</td>
</tr>
</tbody>
</table>

PASE Total score is calculated by summing the scores for all 15 items. The Total score ranges from a minimum of 15 to a maximum of 75 (Table 2). PASE has two sub-scale scores, Function and Symptoms. The Function sub-scale has 7 items, and the maximum Function score is 35. The Symptom sub-scale has 8 items, and the maximum Symptom score is 40.

<table>
<thead>
<tr>
<th>TABLE 2: Symptom Function</th>
<th>Total PASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>score</td>
<td>score</td>
</tr>
<tr>
<td>Minimum</td>
<td>7</td>
</tr>
<tr>
<td>Maximum</td>
<td>35</td>
</tr>
</tbody>
</table>

Interpretation of the Total score

At this point, we have evaluated the Total score in preliminary studies. Recommendations on use of the Symptom and Function scores are not available at this time. The Total score may be interpreted as below in Table 3, although these data are preliminary. Please read the disclaimer at the bottom of the PASE questionnaire carefully, and return the agreement that accompanied the PASE tool to the Director, Corporate Sponsored Research and Licensing, Brigham and Women’s Hospital, prior to using PASE. PASE was developed as a screening tool to evaluate psoriasis patients for the presence of active inflammatory arthritis and must not be used to replace a rheumatology evaluation, for patient care or for treatment recommendations.

For individuals whose PASE score <44 AND their response to question A is ”YES”, please refer individual for rheumatology evaluation. PASE score is not reliable in these individuals who may either not be currently symptomatic with psoriatic arthritis or may be on therapy.

Interpretation of Incorrectly Completed Paper Questionnaires

When PASE is being administered on paper, please use the following guidelines to score:

1. One item is left blank or unanswered: Please score this item 0 and calculate the Total score.
2. Two or more items left blank or unanswered: Please do not score this questionnaire, and re-administer PASE when possible.
3. Two or more responses are selected for an item, e.g., item 8 is answered as both “Strongly Agree” and “Agree”: Please select the higher score. In this example, score item 8 with 5 points for “Strongly Agree.”

An item is marked incorrectly between two responses, e.g., item 10 is marked between “Neutral” and ”Disagree”: Please score this item 0 and calculate the Total score.

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PASE Questionnaire references


If you are interested in obtaining the PASE questionnaire for your practice, please contact either Dr. Elaine Husni (husnie@ccf.org) or Dr. Abrar Qureshi (aquareshi@rics.bwh.harvard.edu).

Differential Diagnosis
Patients with typical psoriatic lesions are relatively easy to diagnose, but difficulties may arise when asymmetrical, individual lesions are present; when eruptive, pustular or erythematous phases are evolving; or when the patient has concomitant diseases.17 Diagnoses to rule out are as follows:

- Bowen’s disease (in situ squamous cell carcinoma), often presenting as a single lesion, is found in both sun-exposed and sun-protected areas of the body.
  » The plaque is well demarcated, pink to red in color, with varying amounts of scale.
  » A biopsy of the skin lesion is diagnostic.

- Eczema may be confused with discoid plaque psoriasis, erythrodermic psoriasis, generalized pustular psoriasis (von Zumbusch) or palmoplantar psoriasis.
  » Primary lesions may include papules, patches and plaques; in severe eczema, weeping and crusting may predominate. Long-standing eczema may become lichenified, characterized by thickened, scaling skin that resembles psoriasis.
  » Acute eczema with vesiculation is easily differentiated from psoriasis, as vesiculation is seldom seen with psoriasis.

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  » Primary lesions may include papules, patches and plaques; in severe eczema, weeping and crusting may predominate. Long-standing eczema may become lichenified, characterized by thickened, scaling skin that resembles psoriasis.
  » Acute eczema with vesiculation is easily differentiated from psoriasis, as vesiculation is seldom seen with psoriasis.
» Hyperkeratotic eczema of the palms and soles is more of a problem, as it is not a specific diagnosis but is used to describe several disorders, such as the following:

- Chronic palmoplantar eczema (e.g., allergic contact dermatitis, irritant dermatitis or atopic dermatitis)

- “Dermatitis” of palms and soles that is not eczema or psoriasis, i.e., overlap

- Dyshidrotic eczema of palms and soles

- A skin biopsy may sometimes help differentiate chronic hyperkeratosis and erythema of the palms and soles from psoriasis. Unfortunately, biopsies often reveal a combination of spongiotic and psoriasiform changes that are not specific to either psoriasis or allergic/irritant dermatitis.

• Mycosis fungoides, patch or plaque stage (cutaneous T cell lymphoma)

» In its early stages cutaneous T cell lymphoma (CTCL) may be confused with psoriasis, but unlike psoriasis, it tends not to have the “true” micaceous scale.

- CTCL may present as erythroderma (Sezary’s syndrome) and should be considered when no apparent cause of erythroderma is found.

- As CTCL develops within plaque lesions, the palpable component of the plaque increases.\(^{18}\)

- A skin biopsy in which atypical T lymphocytes are found in the epidermis and dermis is diagnostic.

• Pityriasis rubra pilaris (PRP) may be confused with erythrodermic psoriasis.

» Follicular papules are characteristic, with follicular hyperkeratosis on the back of the finger.\(^{19}\) The scalp may show psoriasis-like changes.

» Patients with PRP are differentiated by having islands of unaffected skin (“skip areas”) surrounded by involved skin and yellowish or palmoplantar keratoderma.

» Classic psoriatic nail changes are absent.

» Histologic examination of a hyperkeratotic papule may be diagnostic.

• PsEma is a term coined to describe signs and symptoms of a combination of psoriasis and eczema.\(^{20}\)

» An overlap syndrome with clinical features of both diseases.

» Not at present widely accepted. It is not a recognized diagnosis.
Reiter’s syndrome should be differentiated from psoriatic arthritis. These two diseases have many similarities, but differ significantly in their clinical presentation and natural history.

Psoriatic arthritis occurs in as many as 30% of psoriasis patients, often when skin involvement is severe. It is more gradual in onset, affects the upper extremities and is not associated with mouth ulcers, urethritis or bowel symptoms.16

In Reiter’s syndrome, the onset of arthritis is acute, with symptoms occurring in new joints over a period of a few days to a few weeks. The arthritis is asymmetric and additive. Joint symptoms may persist in as many as 30% to 60% of patients.21

The most common sites of involvement in Reiter’s syndrome are the knee, ankle and toe joints, but the wrist and fingers can also be affected. A “sausage digit”—a diffuse swelling of a single finger or toe—is typical of both Reiter’s arthritis and psoriatic arthritis. Low back and spinal pain are common.

Patients with Reiter’s syndrome often have conjunctivitis, mucocutaneous lesions and genitourinary disease. Nail changes are common.

Infection with *Shigella, Salmonella, Yersinia, Campylobacter species, clostridium difficile,* and *Chlamydia trachomatis* may initiate Reiter’s syndrome.

In the majority of cases, a history will reveal an infection one to four weeks before symptoms appear; however, some show no signs of an earlier infection. Some patients report a new sexual partner.

Lab findings: elevated ESR during acute phase, mild anemia, elevated WBC in synovial fluid, positive HLA-B27 antigen, and serologic evidence of infection. Culture is likely to be negative.

Secondary syphilis-psoriasiform type may be difficult to differentiate from guttate psoriasis. Syphilis may involve the face and often involves the palms and soles, producing psoriasiform papules with “collarette” of scale.

Patients may also have nonscarring alopecia, mucous patches in the mouth, lymphadenopathy, malaise, fever, headache and myalgias.18

The primary lesion may or may not still be evident.

Lab tests: VDRL and skin biopsies are diagnostic.

Subacute cutaneous lupus erythematosus (SCLE) is characterized by a widespread photosensitive, nonscarring eruption that can present in two different forms.22
» The first form is a psoriatic-like papulonquamous eruption with discrete erythematous patches on the back, chest, shoulders, arms and the backs of the hands. The scaling patches tend to merge into large plaques.

» The second is an annular form with central clearing and peripheral scale.

» Acute SCLE is characterized by a “butterfly” rash on the face, which consists of erythema of the nose and cheeks.

» Lab tests: a panel of antibody tests helps differentiate various forms of lupus erythematosus (Ro and La).

- Tinea corporis is a localized-to-wide-spread fungal infection of non-hair-bearing skin with a varying presentation, depending on the severity of the inflammatory response.23

» It may have the appearance of “ringworm” or appear as deep inflammatory nodules or granulomas.

» Characterized by papulosquamous pink-red skin lesions with central clearing and peripheral scale.

» Lab tests: KOH stain and/or fungal culture of scale or biopsy.

Table 2-6 lists the types of psoriasis and differential diagnosis

<table>
<thead>
<tr>
<th>Type of Psoriasis</th>
<th>Differential Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Plaque</td>
<td>Eczema, PsEMA (combination of psoriasis and eczema), mycosis fungoides, patch or plaque stage CTCL, tinea corporis, Bowen’s disease, SCLE</td>
</tr>
<tr>
<td>Guttate</td>
<td>Secondary syphilis, psoriasiform type tinea corporis, Sezary syndrome</td>
</tr>
<tr>
<td>Erythrodermic</td>
<td>PRP, eczema, SCLE, Sezary syndrome</td>
</tr>
<tr>
<td>Pustular</td>
<td>Eczema, PsEma, PSA</td>
</tr>
<tr>
<td>PSA</td>
<td>Reiter’s syndrome</td>
</tr>
</tbody>
</table>

Comorbidities and Psoriasis
There is growing recognition that psoriasis is a systemic inflammatory disease that is associated with increased cardiovascular morbidity and mortality. Diabetes, obesity and metabolic syndrome, as well as myocardial infarction and depression, are more common in patients with psoriasis than in the general population.9,10

Screening for these comorbidities is appropriate. While definitive guidelines have not been established, patients with
psoriasis should at the very least have the recommended evaluations and prevention strategies that are appropriate for their age. Smoking cessation should be encouraged. Patients should also be encouraged to let their primary care physician know about the psoriasis, as psoriasis is an independent cardiovascular risk factor. Depending on other risk factors, blood pressure, body mass index and cholesterol levels may be checked more frequently in this at-risk population.24
CHAPTER 3: CHOOSING A TREATMENT STRATEGY

There are multiple treatment options, as well as several strategies, that can be chosen to treat patients. The options are topical therapy, phototherapy and systemic therapy. (See Table 3-1.) When choosing a therapy, remember that the goals of therapy in treating patients with psoriasis are to:

- Gain initial rapid control of the disease.
- Decrease the involvement of BSA.
- Decrease erythema, scaling and the thickness of lesions of individual plaques.
- Maintain the patient in long-term remission and avoid relapse.
- Avoid adverse effects as much as possible.
- Improve the patient’s quality of life.

In addition to choosing a treatment option, you must also determine which treatment strategy is most appropriate for your patient. The following are the four types of therapeutic strategies you can use when you prescribe the various agents listed in Table 3-1:
Table 3-1: Psoriasis Treatment Options

<table>
<thead>
<tr>
<th>Topical Therapy</th>
<th>Phototherapy</th>
<th>Systemic Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthralin</td>
<td>Goeckerman (tar and UVB)</td>
<td>Retinoids</td>
</tr>
<tr>
<td>Corticosteroid creams, lotions, ointments, gels, foams, shampoos, patches and solutions</td>
<td>Broad-band UVB</td>
<td>Methotrexate immune-modulating therapy</td>
</tr>
<tr>
<td>Tars</td>
<td>Narrow-band UVB</td>
<td>Other cytotoxic immune-modulating therapy</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>PUVA</td>
<td>Cyclosporine</td>
</tr>
<tr>
<td>Retinoid gel and creams</td>
<td>Excimer laser</td>
<td>Biologics - TNF blockers</td>
</tr>
<tr>
<td>Topical immunomodulators</td>
<td></td>
<td>Biologics – Anti-CD2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Biologics – IL12/23 blockers</td>
</tr>
</tbody>
</table>

- Monotherapy, the use of one therapeutic agent during one treatment time.

- Combination therapy, the use of two or more agents in combination during one treatment time. In combination, the agents are sometimes used at lower doses than when they are used in monotherapy.

- Rotation therapy, the use of therapeutic agents for a specified period of time (usually 1 to 2 years), after which they may be switched to alternative agents to avoid cumulative toxicity.

- Sequential therapy, the use of a stronger agent(s) initially to clear the psoriasis rapidly, followed by a less toxic agent(s) for maintenance therapy with transitional strategy to minimize the risk of psoriasis flare between the clearing and maintenance phases.

**Monotherapy**

Monotherapy is often used as initial therapy.

- The advantage of monotherapy is that one drug may limit side effects, decrease costs and improve adherence to the treatment regimen.

- Long-term monotherapy with some agents may lead to toxicity at high doses. Risk factors may accumulate with continuing therapy.

- When monotherapy fails or toxicity develops, another agent or several agents may be added in combination, rotation or sequential therapy.
Combination Therapy
Combination therapy generally allows lower doses of individual agents to be used, helping to minimize toxicity and improve efficacy. Topicals are often used in combination with a systemic agent; however, combinations of systemic agents are often underused. The combination of two systemic agents, or of a systemic agent with phototherapy, is often more effective than each agent individually. When deciding what combination to use or to continue to use, you should evaluate product safety or the agent with the most favorable side-effect profile.

- Allows for a lower dose of each agent to be used. One agent may be discontinued after the psoriasis has cleared and the “safer” of the two agents used for maintenance therapy. Treatment-resistant patients may be continued on both agents.

- Allows the lowest possible effective doses to be used in an effort to minimize toxicity. For example, retinoid doses can be reduced to limit mucocutaneous toxicity and enhance tolerance.

- Allows the combination of a more potent, “less safe” agent for initial clearing with a “safer agent” for use in long-term control.

- Will become more important as new immunosuppressive biologic agents become available (e.g., a cytotoxic agent [methotrexate] has been used with immunosuppressive biologics).

- Table 3-2 lists frequently used combination therapies, and combination therapies to be used with caution.

Rotational Therapy
Rotational therapy may facilitate long-term treatment; in theory it helps minimize chronic toxicity by periodically rotating various therapies before respective drug toxicities occur. (See Figure 3-1.)

- Treatments are rotated, usually at intervals of 1 to 2 years for treatments with known cumulative toxicity, possibly returning to the original therapy thereafter.
Side effects (e.g., methotrexate-induced hepatic changes, cyclosporine-induced hypertension and renal changes, and phototherapy-induced skin changes) may be fully or partially reversed when a drug is discontinued.26

- Retinoid mucocutaneous side effects are completely reversed when the drug is discontinued.

- As new forms of therapy become available, the circle of rotational therapies grows larger and the rotation intervals may change as we gain additional knowledge about new treatments.

*In patients who have developed multiple skin cancers as a result of long-term PUVA, cyclosporine should be avoided, as it may produce further skin cancers.

---

**Table 3-2: Combination Therapy**

<table>
<thead>
<tr>
<th>Frequently Used Combinations</th>
<th>Combinations with Increased Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retinoids and broad-band UVB</td>
<td>Hydroxyurea and methotrexate</td>
</tr>
<tr>
<td>Retinoids and narrow-band UVB</td>
<td>Bone marrow suppressants (e.g. hydroxyurea, methotrexate, 6-thioguanine)</td>
</tr>
<tr>
<td>Retinoids and PUVA (Ultraviolet light A with the drug psoralen)</td>
<td>Drugs that increase cutaneous carcinogenicity (e.g. cyclosporine and PUVA)</td>
</tr>
<tr>
<td>Retinoids and methotrexate</td>
<td></td>
</tr>
<tr>
<td>Retinoids and cyclosporine to decrease cyclosporine dose</td>
<td></td>
</tr>
<tr>
<td>Cyclosporine and methotrexate (low doses of both)</td>
<td></td>
</tr>
<tr>
<td>Mycophenolate mofetil and cyclosporine in order to taper off cyclosporine</td>
<td></td>
</tr>
<tr>
<td>Oral agents (methotrexate, retinoids, cyclosporine) with any biologic</td>
<td></td>
</tr>
<tr>
<td>Cytotoxics (e.g. methotrexate) and phototherapy</td>
<td></td>
</tr>
<tr>
<td>Topicals and retinoids</td>
<td></td>
</tr>
</tbody>
</table>

---

**Figure 3-1: Rotational Therapy**
The concept of rotational therapy was developed before the availability of biologics. Rotation is used less often with biologics, as some of the biologics lose efficacy if they are discontinued and then restarted. In the case of infliximab, not only is efficacy reduced, but infusion reactions are increased.

**Sequential Therapy**

Sequential therapy involves using specific therapeutic agents in a deliberate sequence to maximize the initial speed of improvement and probability of success while minimizing side effects by smoothly transitioning from an initial rapid improvement strategy to a long-term maintenance strategy. Sequential therapy is administered in the following three steps:

Step 1: Clearing or “quick-fix” phase

Step 2: Transitional phase

Step 3: Maintenance phase

Topical therapy can be administered sequentially to maximize initial clearing, proportions just prior to application, they can be applied separately or at the same time or different times, or they can be mixed and used over a prolonged period.

### Table 3-3: Sequential Therapy Examples

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Topical</th>
<th>Traditional Systemic</th>
<th>Biologic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 month for clearing</td>
<td>Calcipotriene or Calcitriol in combination with superpotent topical corticosteroid*, BID†</td>
<td>Cyclosporine initially 3-5 mg/kg/day for rapid improvement</td>
</tr>
<tr>
<td></td>
<td>Calcipotriene or Calcitriol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase 2</td>
<td>1 month (or longer) for transition</td>
<td>Add acitretin 10-25 mg/day and gradually titrate upward to maximally tolerated dose. Then start tapering cyclosporine by 1 mg/kg/day each month</td>
<td>Etanercept 50 mg s.c. 1x/week</td>
</tr>
<tr>
<td></td>
<td>Calcipotriene or Calcitriol BID on weekdays</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Superpotent topical corticosteroid BID on weekends</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase 3</td>
<td>Maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calcipotriene or Calcitriol BID, which may be tapered to once/day and discontinued if appropriate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Superpotent topical corticosteroid and topical tazarotene may be combined in a similar fashion. † Brand name calcipotriene and halobetasol are compatible. They can be mixed fresh in equal proportions.
Table 3-4: Systemic sequential therapy using cyclosporine or infliximab followed by transition to oral retinoids, etanercept, adalimumab or alefacept

<table>
<thead>
<tr>
<th>Phase</th>
<th>Timeframe</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Month 0-2</td>
<td>Infliximab or cyclosporine</td>
</tr>
<tr>
<td>2A</td>
<td>Month 2-3</td>
<td>Oral retinoid or etanercept or adalimumab or alefacept</td>
</tr>
<tr>
<td>2B</td>
<td>Month 3-7</td>
<td>UVB/PUVA</td>
</tr>
<tr>
<td>3A</td>
<td>Month &gt;7</td>
<td>UVB/PUVA</td>
</tr>
<tr>
<td>3B</td>
<td>Month &gt;7 (if needed)</td>
<td>UVB/PUVA</td>
</tr>
</tbody>
</table>

minimize psoriasis recurrence and avoid steroid rebound. For example, halobetasol propionate and calcipotriene may be used as shown in Table 3-3. Sequential therapy regimens are also used with systemic agents (Table 3-3).

When considering the use of systemic therapy, you should keep in mind that the rationale for sequential therapy is that some therapies are better suited for rapid clearance (e.g., methotrexate and cyclosporine) whereas others are less toxic and more appropriate for long-term maintenance (e.g., acitretin). (See Table 3-4.)
CHAPTER 4

Treatment algorithms for specific patient types
Psoriasis is a complex, multi-faceted disease with a diverse array of clinical manifestations and patient expectations. The authors have spent considerable time creating the following algorithms in an attempt to help the reader with specific situations encountered in clinical practice. These algorithms are meant purely as an outline for clinicians in managing their individual patients. It is hoped that the algorithms will help every patient to be treated in a comprehensive fashion, using the algorithms as a general guide to therapy.

Treatment algorithms for various types of patients are included to assist you in choosing optimal treatments. More detailed information on drug dosing and side effects for the individual agents can be found in Chapter 5, “Therapeutic Treatment Options and Their Side Effect Profiles.”

In general, topicals are used for limited disease or as an adjunct to systemic or phototherapy for patients with extensive (so-called “moderate to severe”) psoriasis.

There is no universally effective therapy or therapy combination for psoriasis and psoriatic arthritis. All treatment must be individually tailored to each patient’s needs and the type of disease being addressed. The following algorithms offer...
guidelines for treating specific patient types but are not meant to be restrictive. Keep in mind the following points:

- Patients should not be forced to fail one therapy in order to qualify for a more appropriate therapy.

- Ongoing therapy is often required to maintain remission.

- Life factors such as employment, child-bearing potential, alcohol intake, access to therapies, concomitant conditions such as arthritis or diabetes, response to sunlight, and response to prior therapies must be considered in selecting the ideal treatment for a patient.

- Psoriasis can cause as much disability as cancer, diabetes and other major diseases.

HEALTHY MALE ADULT WITH CHRONIC PLAQUE PSORIASIS (> 5% BSA), W/O PSORIATIC ARTHRITIS

If UVB phototherapy available, feasible, practical and suitable

First line

- UVB phototherapy (NB or BB)
  - UVB phototherapy alone
  - UVB phototherapy + adjuvant topical agents
  - UVB phototherapy + systemic retinoids
  - Goeckerman

Second line

- Combination therapies
  - CsA + MTX
  - MTX + biologic
  - CsA + biologic
  - UVB + biologic
  - Systemic retinoid + biologic

If UVB phototherapy unavailable, contraindicated, ineffective or patient unable to comply

First line

- Adalimumab
- Alefacept
- Cyclosporine
- Etanercept
- Infliximab
- Methotrexate
- PUVA
- Systemic retinoids
- Ustekinumab
### HEALTHY CHILDREN UNDER 18 WITH CHRONIC PLAQUE PSORIASIS (⟩ 5% BSA), W/O PSORIATIC ARTHRITIS

If UVB phototherapy available, feasible, practical and suitable

* UVB phototherapy (NB or BB)
  - UVB phototherapy alone
  - UVB phototherapy + adjuvant topical agents
  - UVB phototherapy + systemic retinoids (for special cases)
  - Goeckerman

If UVB phototherapy unavailable, contraindicated, ineffective or patient unable to comply

* Adalimumab*
* Cyclosporine*
* Etanercept*
* Infliximab*
* Methotrexate*
* PUVA (dark skin)*

### WOMEN TRYING TO BECOME PREGNANT WITH CHRONIC PLAQUE PSORIASIS (⟩ 5% BSA), W/O PSORIATIC ARTHRITIS

If UVB phototherapy available, feasible, practical and suitable

* Topical calcipotriene/calcitriol
* Topical corticosteroids
* Moisturizers and UVB phototherapy (NB and BB)
* Goeckerman

If UVB phototherapy unavailable, contraindicated, ineffective or patient unable to comply

* Adalimumab
* Alefacept
* Cyclosporine
* Etanercept
* Infliximab
* PUVA
* Ustekinumab

* Not approved for treatment of psoriasis in children
GUTTATE PSORIASIS (> 5% BSA), W/O PSORIATIC ARTHRITIS

If UVB phototherapy available, feasible, practical and suitable

First line

- UVB phototherapy (NB or BB)

Second line

- Adalimumab
- Alefacept
- Cyclosporine
- Etanercept
- Infliximab
- Ustekinumab

If UVB phototherapy unavailable, contraindicated, ineffective or patient unable to comply

First line

- PUVA
- Short course MTX or CsA

Second line

- Adalimumab
- Etanercept
- Combinations: MTX and TNF, retinoids and TNF, retinoids and CsA, CsA and MTX

ERYTHRODERMIC PSORIASIS IN MALES OR FEMALES NOT OF CHILDBEARING POTENTIAL

First line

- Cyclosporine
- Infliximab
- Methotrexate
- Systemic Retinoids

Second line

- Adalimumab
- Etanercept
- Combinations: MTX and TNF, retinoids and TNF, retinoids and CsA, CsA and MTX

Adjunctive topicals such as wet compresses, cool baths, mid-potency steroid ointment, hospitalization

Once stable, initiate maintenance with plaque psoriasis algorithm
CURRENTLY HEAVY ALCOHOL INTAKE WITH CHRONIC PLAQUE PSORIASIS (> 5% BSA), W/O PSA IN MALES OR FEMALES NOT OF CHILDBEARING POTENTIAL

If UVB phototherapy available, feasible, practical and suitable

First line

- UVB phototherapy (NB or BB)
  - UVB phototherapy alone
  - UVB phototherapy + adjuvant topical agents
  - UVB phototherapy + systemic retinoids (for special cases)
  - Goeckerman

Second line

- Combination therapies

HEPATITIS C WITH CHRONIC PLAQUE PSORIASIS (> 5% BSA), W/O PSORIATIC ARTHRITIS IN MALES OR FEMALES NOT OF CHILDBEARING POTENTIAL

If UVB available, feasible, practical and suitable

First line

- UVB phototherapy (NB or BB)
  - UVB phototherapy alone
  - UVB phototherapy + adjuvant topical agents
  - UVB phototherapy + systemic retinoids (for special cases)
  - Goeckerman

Second line

- Alefacept
- Azathioprine
- Cyclosporine
- Combination therapies

* Liver studies should be monitored

If UVB unavailable, contraindicated, ineffective or patient unable to comply

First line

- Adalimumab*
- Etanercept*
- Infliximab*
- PUVA
- Systemic retinoids

Second line

- Alefacept
- Azathioprine
- Cyclosporine
- Combination therapies

* Strength of data regarding safety of use greater for etanercept than adalimumab or infliximab.
**HEALTHY ADULTS WITH PALMOPLANTAR PSORIASIS, W/O PSORIATIC ARTHRITIS IN MALES OR FEMALES NOT OF CHILDBEARING POTENTIAL**

<table>
<thead>
<tr>
<th>First line</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Topical corticosteroids</td>
</tr>
<tr>
<td>• Topical calcipotriene/calcitriol</td>
</tr>
<tr>
<td>• Topical calcipotriene-steroid combination</td>
</tr>
<tr>
<td>• Topical tazarotene</td>
</tr>
<tr>
<td>• Keratolytics</td>
</tr>
<tr>
<td>• Moisturization</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Systemic retinoids</td>
</tr>
<tr>
<td>• Targeted UVB phototherapy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third line</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adalimumab</td>
</tr>
<tr>
<td>• Alefacept</td>
</tr>
<tr>
<td>• Cyclosporine</td>
</tr>
<tr>
<td>• Etanercept</td>
</tr>
<tr>
<td>• Infliximab</td>
</tr>
<tr>
<td>• Methotrexate</td>
</tr>
<tr>
<td>• PUVA/topical or systemic</td>
</tr>
<tr>
<td>• Ustekinumab</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fourth line</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Combination therapies</td>
</tr>
<tr>
<td>» CsA + MTX</td>
</tr>
<tr>
<td>» CsA + biologic</td>
</tr>
<tr>
<td>» MTX + biologic</td>
</tr>
</tbody>
</table>

**HIV INFECTION WITH CHRONIC PLAQUE PSORIASIS (> 5% BSA), W/O PSA IN MALES OR FEMALES NOT OF CHILDBEARING POTENTIAL**

<table>
<thead>
<tr>
<th>First line</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adequate HIV control with antiviral treatment</td>
</tr>
</tbody>
</table>

If UVB available, feasible, practical and suitable

<table>
<thead>
<tr>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Systemic retinoids</td>
</tr>
</tbody>
</table>

If UVB phototherapy unavailable, contraindicated, ineffective or patient unable to comply

<table>
<thead>
<tr>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>• UVB phototherapy (NB or BB)</td>
</tr>
<tr>
<td>» UVB phototherapy alone</td>
</tr>
<tr>
<td>» UVB phototherapy + adjuvant topical agents</td>
</tr>
<tr>
<td>» Goeckerman</td>
</tr>
<tr>
<td>• PUVA photochemotherapy</td>
</tr>
<tr>
<td>» PUVA photochemotherapy alone</td>
</tr>
<tr>
<td>» PUVA photochemotherapy + adjuvant topical agents</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third line</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adalimumab</td>
</tr>
<tr>
<td>• Cyclosporine</td>
</tr>
<tr>
<td>• Etanercept</td>
</tr>
<tr>
<td>• Hydroxyurea</td>
</tr>
<tr>
<td>• Infliximab</td>
</tr>
<tr>
<td>• Methotrexate</td>
</tr>
</tbody>
</table>
**PUSTULAR PSORIASIS IN MALES OR FEMALES NOT OF CHILDBEARING POTENTIAL**

**First line**
- Cyclosporine
- Infliximab
- Methotrexate
- Systemic retinoids

**Second line**
- Adalimumab
- Etanercept
- PUVA photochemotherapy

In conjunction with adjunctive topicals such as wet compresses, cool baths, mid-potency steroid ointment, hospitalization

Rule out sepsis

Once stable, initiate maintenance with plaque psoriasis algorithm

**CHRONIC PLAQUE PSORIASIS (> 5% BSA), WITH CONCURRENT PSORIATIC ARTHRITIS**

**First line**
- Adalimumab
- Etanercept
- Golimumab
- Infliximab
- Methotrexate
- Biologic + MTX

Consider referral for rheumatology evaluation, X-ray studies and range-of-motion studies

* Mild psoriatic arthritis can be treated with non-steroidal anti-inflammatory agents.
HYPERTENSION WITH CHRONIC PLAQUE PSORIASIS (> 5% BSA), W/O PSORIATIC ARTHRITIS IN MALES OR FEMALES NOT OF CHILDBEARING POTENTIAL

If UVB phototherapy available, feasible, practical and suitable

First line

- UVB phototherapy (NB or BB)
  - UVB phototherapy alone
  - UVB phototherapy + systemic retinoids
  - UVB phototherapy + adjuvant topical agents
  - Goeckerman

Second line

- Combination therapies
  - MTX + biologic
  - Retinoid + biologic
  - Biologic + UVB phototherapy

If UVB phototherapy unavailable, contraindicated, ineffective or patient unable to comply

First line

- Adalimumab
- Alefacept
- Etanercept
- Infliximab
- Methotrexate
- PUVA
- Systemic retinoids
- Ustekinumab

Second line

- Methotrexate*

Third line

- Cyclosporine*
  - Combination therapies
    - MTX + CsA*
    - MTX + biologic*
    - CsA + biologic (short term only)*
    - Biologic + UVB

* When using these medications, screen for possible impairment of renal and/or hepatic function.

HEALTHY ELDERLY PATIENT WITH CHRONIC PLAQUE PSORIASIS (> 5% BSA), W/O/OUT PSORIATIC ARTHRITIS

If UVB phototherapy available, feasible, practical and suitable

First line

- UVB phototherapy (NB or BB)
  - UVB phototherapy alone
  - UVB phototherapy + systemic retinoids
  - UVB phototherapy + adjuvant topical agents
  - Goeckerman
  - PUVA

Second line

- Methotrexate*

Third line

- Cyclosporine*
  - Combination therapies
    - MTX + CsA*
    - MTX + biologic*
    - CsA + biologic (short term only)*
    - Biologic + UVB

If UVB phototherapy unavailable, contraindicated, ineffective or patient unable to comply

First line

- Adalimumab
- Alefacept
- Etanercept
- Infliximab
- Systemic retinoids
- Ustekinumab
HEALTHY ADULT WITH SEVERE NAIL PSORIASIS, W/O PSORIATIC ARTHRITIS

Patients desiring non-invasive treatment

First line
- Cosmetic treatment
- Topical steroids

Second line
- Adalimumab
- Alefacept
- Cyclosporine
- Etanercept
- Infliximab
- Methotrexate
- Systemic retinoids
- Ustekinumab

Patients desiring more aggressive treatment

First line
- Intraleisonal steroids

HEALTHY PERSON OF COLOR WITH CHRONIC PLAQUE PSORIASIS (> 5% BSA), W/O PSORIATIC ARTHRITIS IN MALES OR FEMALES NOT OF CHILDBEARING POTENTIAL

If UVB phototherapy available, feasible, practical and suitable

First line
- UVB phototherapy (NB or BB)
  - UVB phototherapy alone
  - UVB phototherapy + systemic retinoids
  - UVB phototherapy + adjuvant topical agents
    - Goeckerman
    - PUVA

If UVB phototherapy unavailable, contraindicated, ineffective or patient unable to comply

First line
- Adalimumab
- Alefacept
- Cyclosporine
- Etanercept
- Infliximab
- Methotrexate
- Systemic retinoids
- Ustekinumab

Second line
- Combination therapies
  - CsA + MTX
  - CsA + biologic
  - MTX + biologic
  - Biologic + systemic retinoid
  - Biologic + UVB
HEALTHY ADULTS WITH CHRONIC PLAQUE PSORIASIS (> 5% BSA), AND HISTORY OF SKIN CANCER, W/O PSORIATIC ARTHRITIS IN MALES OR FEMALES NOT OF CHILDBEARING POTENTIAL

First line

- Systemic retinoids, if baseline lipids WNL

If UVB phototherapy available, feasible, practical and suitable

- If UVB phototherapy unavailable, contraindicated, ineffective or patient unable to comply

Second line

- UVB phototherapy (NB or BB)
  - UVB phototherapy alone
  - UVB phototherapy + systemic retinoids
  - UVB phototherapy + adjuvant topical agents
  - Goeckerman

Second line

- Adalimumab
- Alefacept
- Etanercept
- Infliximab
- Methotrexate
- Ustekinumab

Third line

- Combination therapies
  - MTX + biologic
  - UVB + biologic (only if absolutely necessary)

Cyclosporine and PUVA should be avoided if possible, as they may increase the risk for both non-melanoma skin cancer, especially in fair-skinned patients, and melanoma. At the present time there is no known contraindication to biologic therapies in patients with a significant past medical history of various skin cancers. However, as experience with these agents increases, this recommendation may need to be modified as there have been case reports about the development of skin cancers when some of these agents are used.
**WOMEN OF CHILDBEARING POTENTIAL USING APPROPRIATE CONTRACEPTION WITH CHRONIC PLAQUE PSORIASIS (> 5% BSA), W/O PSORIATIC ARTHRITIS**

If UVB phototherapy available, feasible, practical and suitable

- UVB phototherapy (NB or BB)
  - UVB phototherapy alone
  - UVB phototherapy + systemic retinoids*
  - UVB phototherapy + adjuvant topical agents
  - UVB + short-term isotretinoin, if necessary*
  - Goekerman

If UVB phototherapy unavailable, contraindicated, ineffective or patient unable to comply

- First line
  - Adalimumab
  - Alefacept
  - Cyclosporine
  - Etanercept
  - Infliximab
  - Methotrexate
  - PUVA
  - Ustekinumab

- Second line
  - Combination therapies
    - MTX + CsA
    - MTX + biologic
    - Isotretinoin (short term, if necessary)*
    - + biologic
    - Biologic + UVB

*Women of childbearing potential should be informed about the need to abstain from becoming pregnant and remain on appropriate contraception for the recommended interval after the discontinuation of these medications. Other oral retinoids with a short half-life similar to isotretinoin would also be appropriate for short-term use if needed in this setting.
HEALTHY ADULT WITH SCALP PSORIASIS, W/O PSORIATIC ARTHRITIS IN MALES OR FEMALES NOT OF CHILDBEARING POTENTIAL

**First line**
- Medicated shampoos including tar, salicylic acid, selenium, topical steroid, zinc or ketoconazole
- Topical steroids—variety of vehicles
- Topical tars
- Topical calcipotriene
- Topical tazarotene
- Anthralin

**Second line**
- Alefacept
- Adalimumab
- Cyclosporine
- Etanercept
- Infliximab
- Methotrexate
- Systemic retinoids
- Targeted UVB phototherapy
- Ustekinumab
CHAPTER 5: THERAPEUTIC TREATMENT OPTIONS & THEIR SIDE EFFECT PROFILES

The three types of therapies available for treating psoriasis are:

1. **Topical therapies**
2. **Phototherapies**
3. **Systemic therapies**

**Topical Therapies**

**Steroids**

Topical corticosteroids, formulated as lotions, solutions, creams, foams, ointments, gels, sprays and shampoos are the most commonly prescribed agents for treating mild to moderate psoriasis. In severe psoriasis, they may be prescribed as adjunctive therapy along with systemic therapy or phototherapy.

**Dosing**

Topical corticosteroids are available in many different strengths, ranging from class 7 steroids such as 1% hydrocortisone to superpotent class 1 corticosteroids such as clobetasol propionate, halobetasol propionate, 0.1% fluocinonide, diflorasone diacetate and betamethasone dipropionate. Superpotent corticosteroids should not be used continuously for more than two to four weeks, and dosage should not exceed 50 g/week.29

**Side Effects**

- Suppression of the hypothalamic-pituitary-adrenal (HPA) axis may occur with medium-to-superpotent topical corticosteroids.30
• Infants and children are more susceptible to HPA suppression because of their high ratio of skin surface to body mass.

• Atrophy of the epidermis and dermis.

• Long-term use may result in thin, shiny, fragile skin that is easily lacerated and subject to purpura and striae.

• Tachyphylaxis. The repeated use of topical corticosteroids is problematic, since effectiveness appears to gradually decrease. This drawback has led to the development of intermittent therapy, in which the superpotent topical steroid is only applied in pulses (e.g., on weekends).

**Anthralin: Psoriatec®**

Anthralin is a yellowish cream used to treat mild to moderate psoriasis and refractory scalp psoriasis. Its use has declined since the introduction of calcipotriene and tazarotene.

**Dosing**

Anthralin cream <1% is applied overnight. Anthralin 1% is applied for a shorter period of time (for only a few minutes up to 60 minutes). Short-contact anthralin therapy (SCAT) may minimize staining and irritation.

**Side Effects**

• Stains skin, clothing and furniture. Micanol releases anthralin as it melts at skin temperature; hence, although the patient’s skin may be stained, clothing and furniture may not be.

• Skin irritation. After anthralin is washed off, triethanolamine may be applied to prevent or lessen irritation.

**Coal Tar Preparations: Psorent®, Scytera®**

Tar preparations have been used for many years as adjunctive therapy. They are used less often since the introduction of calcipotriene and tazarotene.

**Dosing**

Tar-containing compounds are available as shampoos, creams, gels, solutions, foams or ointments that can be applied to lesions or as solutions to be added to the bath.

**Side Effects**

• Stains skin and clothing; preparations are usually smelly.

• Sensitivity to sun is increased.

**Clinical Pearls**

• Tar preparations increase skin sensitivity to ultraviolet light; they are often combined with UVB phototherapy to enhance efficacy.

**Vitamin D Analogs: Calcipotriene, Cream and Scalp Solution, 0.005% (Dovonex®), Calcitriol Ointment (Vectical®)**

Calcipotriene is a vitamin D analog indicated for the topical treatment of plaque...
psoriasis and moderately severe psoriasis of the scalp. Calcipotriene does not stain like anthralin and is less irritating. It does not have corticosteroid side effects. Calcipotriene combination therapy with a superpotent corticosteroid is superior to either agent alone.\textsuperscript{37}

Calcitriol, a naturally occurring form of vitamin D, is comparable to calcipotriene in efficacy, but is less irritating when applied to intertriginous psoriasis. Like calcipotriene, it does not have corticosteroid side effects.\textsuperscript{38}

**Dosing**
Apply to affected area twice daily.\textsuperscript{38, 39}

**Side Effects**
- Irritant contact dermatitis at the site of application.

- Hypercalcemia has been reported in rare instances in patients who applied large quantities over much of their body (>120 g/week for calcipotriene, 200 g/week for calcitriol).

**Clinical Pearls**
- Topical Vitamin D analogs may be used on the face or the genital area without risk of atrophy; however, there is increased risk of irritation in these areas. Diluting with petrolatum or concomitant treatment with a topical corticosteroid may prevent irritation of the face or intertriginous areas.\textsuperscript{30} Calcitriol is less irritating on intertriginous sites.\textsuperscript{38}

- Do not combine with salicylic acid or other acids.

- Use after phototherapy. Calcipotriene is inactivated by UVA and may cause burning sensation if applied just before UVB phototherapy. Calcitriol is inactivated by UVA and by UVB and prevents transmission of ultraviolet light.\textsuperscript{40}

**Combination Products:** *Calcipotriene/betamethasone dipropionate (Taclonex \textsuperscript{®} ointment and scalp suspension)*
The combination of calcipotriene and betamethasone dipropionate is available as a fixed combination for psoriasis and is superior to either ingredient alone. It is applied once daily and its use on an “as needed” basis has been studied for up to a year.

**Retinoids:** *Tazarotene Topical Gel and Cream 0.05% and 0.1% (Tazorac\textsuperscript{®})*
Tazarotene, a topical retinoid, is not associated with the side effects of corticosteroids. Tazarotene topical cream is indicated for the treatment of stable-plaque psoriasis involving up to 20% of BSA. The combination of tazarotene with corticosteroid therapy helps avoid irritant dermatitis and produces better results than corticosteroid monotherapy.\textsuperscript{30}

**Dosing**
Apply once a day, usually in the evening.\textsuperscript{41}
**Side Effects**
- Retinoid dermatitis at the site of application, especially with 0.1% gel.
- Increased sunburn risk.

**Clinical Pearls**
- If irritation occurs, minimize the application amount and frequency; consider adding topical corticosteroids.
- Its combination with UVB may make UVB more effective; however, UV doses should be reduced by at least one-third to reduce burning.42,43
- Pregnancy Category X: Retinoids should not be used by women who are or may become pregnant.41

**Phototherapy**

**UVA**
Treatment with ultraviolet light A (UVA) exposes the patient to an indoor artificial source of UVA (320-400 nm) radiation. UVA radiation as monotherapy produces only mild to moderate improvement and is not recommended if other forms of phototherapy are available. UVA treatment is most often used as a component of PUVA therapy.44

**PUVA**
This approach involves the use of methoxsalen (Oxsoralen®) prior to UVA radiation for the treatment of moderate to severe psoriasis. Treatments are administered two or three times a week; after 20 to 30 treatments, nearly 90% of patients are markedly improved or clear.45

Despite being one of the most effective treatments for psoriasis, PUVA use is declining because of its association with cutaneous malignancies.30 However, this association has been demonstrated only in Caucasian patients. None of the studies on non-Caucasian patients have shown evidence of cutaneous malignancies, including squamous cell skin cancers. PUVA therapy may be used in combination with acitretin or methotrexate.

**Dosing**
- Oxsoralen-Ultra® 0.4 mg/kg PO 90 minutes before UVA.
- Oxsoralen (crystalline) 0.6 mg/kg orally 2 hours before UVA.
- UVA dosing depends on Fitzpatrick skin type. Monitor the output of the UVA box with a photometer.
- Consider rePUVA (retinoid + PUVA) for any patients with concerns about skin cancer risk or who want faster and more effective PUVA photochemotherapy.

**Side Effects**
- Melanoma. One U.S. study found that PUVA increased the risk of malignant melanoma, especially among those who received more than 250 treatments.46
However, other U.S. and European studies have not shown the same association. A large Swedish study with the same length of follow-up as the U.S. study did not demonstrate an association between melanoma and PUVA.\textsuperscript{47}

- **Phototoxicity.** Patients should avoid sun or be instructed to wear UVA-blocking sunscreens on days they are given methoxsalen.

- **Nausea after methoxsalen dose.** To avoid nausea, the methoxsalen dose is divided and given over a 15-minute period with food. Also, the patient may take 1,500 mg of ginger 20 minutes before methoxsalen treatment. Antiemetics such as trimethobenzamid HCL (Tigan\textsuperscript{®}) 250 mg may be given 30 minutes before methoxsalen, or promethazine suppositories 12 to 25 mg (which may cause drowsiness) may be used.

PUVA bath therapy, which obviates GI tract exposure, can be used as an alternative to oral methoxsalen if UVA exposure is practical within 30 minutes of PUVA bath therapy at home. In PUVA bath therapy, 50 mg of 8-methoxypsoralen (Oxsoralen-Ultra) is dissolved in a cup of hot water, which is then mixed with about 100 liters of water in a bathtub. The tub must be filled to the same height each time. Non-oral or bath delivery of psoralen has the following advantages:\textsuperscript{48}:

- No facial exposure to PUVA
- Elimination of nausea
- Minimal risk of ocular changes
- Lessening of total UVA irradiation
- Possible reduction in the risk of PUVA-induced cutaneous cancers (long-term bath PUVA studies have uniformly failed to show increase in skin cancer risk)

**Clinical Pearls**

- No increase in skin cancer of any type in non-Caucasians.

- Advise patients not to use tanning beds. The combination of Oxsoralen and tanning beds can result in life-threatening burns.

- Advise patients taking a photosensitizing drug (e.g., quinolones) to take the drug only after PUVA therapy, not before, and only if such agent cannot be discontinued.

- Use phototherapy carefully in patients taking drugs that increase photosensitivity. Reduce the initial dose of UV, and use smaller incremental doses. Advise patients to maximize the time period between the ingestion of photosensitizing drugs and phototherapy.
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**Table 5-1: Combination Therapy—Special Considerations for Monitoring**

<table>
<thead>
<tr>
<th>Therapy being added</th>
<th>MTX</th>
<th>CsA</th>
<th>Acitretin</th>
<th>UVB</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTX</td>
<td>Monitor CBC &amp; renal function, electrolytes, Mg(^{2+}); use lower doses of both drugs</td>
<td>Monitor LFTs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CsA</td>
<td>Monitor CBC &amp; renal function, electrolytes, Mg(^{2+}); use lower doses of both drugs</td>
<td>Monitor lipids, renal function, electrolytes and Mg(^{2+})</td>
<td>Monitor for squamous cell carcinoma</td>
<td></td>
</tr>
<tr>
<td>Acitretin</td>
<td>Monitor LFTs, lipids and CBC</td>
<td>Monitor lipids, renal function, electrolytes and Mg(^{2+})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UVB</td>
<td>Monitor for squamous cell carcinoma</td>
<td>Decrease acitretin dose by 50% if given daily or give full dose every other day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUVA</td>
<td>Monitor for squamous cell carcinoma</td>
<td>Not recommended</td>
<td>Decrease acitretin dose to 25 mg/day or every other day; decrease UVA by 50%</td>
<td>Monitor for photodamage</td>
</tr>
</tbody>
</table>

*MTX = methotrexate  
CsA = cyclosporine A  
CBC = complete blood count  
LFT = liver function test*

**Broad-band UVB**

In the U.S., broad-band ultraviolet light B (UVB) phototherapy has been used for a century for treating moderate to severe psoriasis or localized areas of stubborn plaques. UVB can be combined with other topical and/or systemic agents to enhance efficacy, but some of these may increase photosensitivity and burning, or shorten remission.\(^{30,49}\) Combining UVB with systemic therapies may increase efficacy dramatically and allow lower doses of...
the systemic to be used. (See Table 5-1 for combinations and monitoring.)

Goeckerman (tar and UVB) is a very safe and effective regimen. Suberythemogenic doses of UVB can be used with up to 10% crude coal tar, and up to 10% salicylic acid in petrolatum. This preparation is messy and difficult to use at home; however, highly motivated patients with local resistant lesions—such as those on the elbows—may benefit.50

**Dosing**

Dosing is based on minimal-erythema-dose (MED) testing or skin types. For skin type I, dosing may start at 10 mJ, whereas dosing for a patient with skin type VI (black) may start at 50 mJ.50 Broad-band UVB is administered three to five times a week for 1 to 2 months or longer, especially if maintenance therapy is indicated.

**Combination Therapy Dosing**

- **UVB + low-dose methotrexate:** three doses taken within 24 hours (total: 15 mg a week; alternatively, the entire dose can be taken at one time per week) until clearing to < 3% BSA. Avoid taking methotrexate prior to UVB phototherapy (rare methotrexate-induced acute photosensitivity may result in a burn).

- **UVB + low-dose acitretin:** 10 to 30 mg/day (most often 25 mg QD or QOD with food) and lower doses of UVB.

**Side Effects**

- Increased photosensitivity and burning unless UVB dosing is individualized

**Clinical Pearls**

- Can be used for long-term maintenance. If the patient is unable to return for office UVB treatments, consider suggesting that the patient use a home UVB unit. For a patient who cannot come to the office even for initial therapy, consider suggesting the use of a tanning bed or sunlight as a last resort.

- Salicylic acid blocks UVB.

- Increase monitoring during combination therapy. (See Table 5-1)

**Narrow-band UVB (nbUVB)**

The most effective wavelength of UVB for treating moderate to severe psoriasis is 311 nm. Treatment with nbUVB is superior to treatment with broad-band UVB and is safer than PUVA treatment.51,52 The efficacy of nbUVB is similar to that of PUVA in the initial clearing phase, but remissions are not as durable.

**Side Effects**

- Burns that are more severe and longer-lasting than those caused by broad-band UVB.

**Clinical Pearls**

- May be less photocarcinogenic.
Particularly useful in treating psoriasis refractory to broad-band UVB.

Use carefully in patients taking drugs that increase photosensitivity.

**Systemic Therapies**

**Acitretin (Soriatane®)**

Acitretin is a synthetic retinoid that is effective for treating plaque, pustular, palmoplantar, guttate and erythrodermic psoriasis. An absolute drop in the psoriasis area and severity index (PASI) score of 57% was observed by week 12. Seventy percent of patients with severe disease showed marked improvement after one year of treatment. Long-term use is safe; there are no time-limit restrictions, making it useful for maintenance therapy.

Although infrequent, symptoms related to bone changes or calcified ligaments or tendons may limit long-term use in selected patients. Published prospective studies on long-term, low-dose use of acitretin in psoriasis patients have all failed to demonstrate increased risk of hyperostosis such as bone spurs.

Acitretin is a potent teratogen and should not be used in women of childbearing potential if avoidable. Acitretin can be converted to etretinate which has a long half-life; patients should avoid pregnancy for three years after taking acitretin.

In combination therapy, acitretin enhances efficacy and allows lower doses of each drug to be used. The following applies to combination therapy including acitretin:

- Combination with PUVA or UVB light therapies enhances efficacy in plaque or guttate psoriasis and limits treatment frequency, duration and cumulative doses.
- Combination with methotrexate is effective for severe, generalized pustular psoriasis.
- Sequential therapy with cyclosporine and acitretin is effective for severe, generalized psoriasis. Cyclosporine is used initially as monotherapy to clear the psoriasis; acitretin is then added for maintenance and cyclosporine is tapered.

**Dosing**

- Monotherapy: 10 to 50 mg/day.
- Combination therapy: 10 to 25 mg PO, QD to QOD.

**Side Effects and Management Options**

Table 5-2 details the side effects of acitretin and corresponding management options.

**Clinical Pearls**

- Essentially no known drug interactions with other psoriasis therapies except for possible enhanced hepatotoxicity with methotrexate (FDA considers this combination “contraindicated”). Can be combined with almost any other treatment at lower doses to enhance efficacy.
### Table 5-2: Side Effects of Acitretin and Management Options

<table>
<thead>
<tr>
<th>Side effects requiring therapy</th>
<th>Management tips</th>
</tr>
</thead>
</table>
| **Headache**                  | • Eye exam; discontinue if papilledema  
                               • If severe, discontinue acitretin |
| **Increased LFT’s**           | • Often transient and reversible  
                               • Ask if taking ASA, acetaminophen, alcohol  
                               • If LFT greater than 2.5 x normal, decrease dose and re-check  
                               • Evaluate for other causes (e.g. hepatitis C) |
| **Pyogenic granulomas**       | • Lower dose  
                               • Consider using steroid gels, silver nitrate, cryotherapy, C&D or surgical removal |
| **Bone changes* Hyperostosis**| • If symptomatic, X-ray  
                               • Treat according to National Osteoporosis Guidelines |
| **Hyperlipidemia**            | • Check triglycerides (TG) at baseline; monitor every 2-4 weeks until stable, every 3-6 months after that  
                               - TG>400 mg/dl: gemfibrozil (Lopid\textsuperscript{®}) 600 mg, BID  
                               - TG>700 mg/dl: discontinue acitretin, start lipid lowering drugs  
                               - Cholesterol >300 mg/dl: atorvastatin (Lipitor\textsuperscript{®}) 10-80 mg, fenofibrate (TriCor\textsuperscript{®}) |
| **Pregnancy considerations**  | **Management tips** |
| **Female on acitretin**       | Category X, cannot use if pregnant or thinking of becoming pregnant |
| **Partner of male on acitretin**| No action, reassure female exposure to male’s semen not associated with birth defects |

<table>
<thead>
<tr>
<th>Mucocutaneous Changes</th>
<th>Management tips</th>
</tr>
</thead>
</table>
| **Chelitis**                  | Emollients (Bag Balm\textsuperscript{®}, Aquaphor\textsuperscript{®})  
                               Antifungal (mycostatin)  
                               Mild topical steroids  
                               Lower dose |
| **Hair Loss**                 | Reversible and dose dependent  
                               Lower dose |
| **Skin fragility**            | Lower dose if symptomatic |
| **Sticky skin**               | None |
| **Dry eye**                   | Lacri-Lube\textsuperscript{®}, artificial tears, cleansing |
| **Dry nose**                  | Petroleum jelly |
| **Thin nails**                | Clear nail polish |
| **Hair Loss**                 | Lower dose dependent  
                               Lower dose |

*Association with retinoids is questionable and subject to controversy, especially in low-dose combinations or maintenance therapy for psoriasis patients.

†To date, only isoretinoin, not acitretin, has been associated with depression.

ASA = acetylsalicylic acid
DISH = diffuse idiopathic skeletal hyperostosis
Alcohol should be avoided in women who may become pregnant because alcohol facilitates the conversion of acitretin to etretinate.57-59

Lipid changes are easily managed with lipid-lowering agents.

Data on hyperostosis is contradictory and subject to controversy.60-61

Retinoid with phototherapy (acitretin-UV) is more effective, better tolerated and perhaps safer for long-term therapy than phototherapy alone.55 UVB and UVA doses can be lowered by about 50% and acitretin doses of 10 to 25 mg/day can be used.62 The treatment is better tolerated and limits the frequency, duration and cumulative doses of individual therapy.

Cyclosporine (Neoral®)
The immunosuppressant cyclosporine was introduced in the 1970s to prevent kidney transplant rejection. Since then, a microemulsion form of cyclosporine called Neoral® has been developed that is absorbed better from the GI tract and is indicated for the treatment of severe, recalcitrant plaque psoriasis. Cyclosporine is highly effective against psoriasis and in short-term therapy may be safer than methotrexate, as bone marrow toxicity is not a concern and it is not usually hepatotoxic. Owing to nephrotoxicity concerns, cyclosporine use is limited in the United States to one year of therapy.

A 16-week study compared methotrexate and cyclosporine’s effectiveness in treating moderate to severe chronic plaque psoriasis. Complete remission (defined as a reduction in the baseline score for the Psoriasis Area and Severity Index [PASI] of more than 90%) occurred in 40% of those patients treated with methotrexate and 33% in the patients treated with cyclosporine. Partial remission (defined as a reduction in the baseline score of more than 75%) was achieved in 60% of the methotrexate-treated patients and 71% of the cyclosporine-treated patients. In this study, there was no significant difference in efficacy found between methotrexate and cyclosporine for the treatment of moderate to severe chronic plaque psoriasis. However, many more patients dropped out of methotrexate arm of the study due to hepatotoxicity and other adverse events.63

Dosing
Starting dose is 4 to 5 mg/kg/day for erythroderma, 3 to 5 mg/kg/day for severe psoriasis and 3 to 5 mg/kg/day for chronic thick plaques.

Reduce dose if creatinine rises >30%, if hypertension develops or if potassium (K+) is persistently above normal.

Side Effects
- Nephrotoxic unless psoriasis guidelines (as above) are followed. Uninterrupted long-term use of more than two years may produce irreversible vasculopathy and interstitial fibrosis even if the creatinine is kept within acceptable range.
### Table 5-3: Side Effects of Cyclosporine and Management Options

<table>
<thead>
<tr>
<th>Side effects requiring therapy</th>
<th>Management tips</th>
</tr>
</thead>
</table>
| Increased $K^+$               | • Discontinue $K^+$-rich foods (e.g. bananas)  
                               |                 | • Consider HCTZ (50 mg, QOD); may reduce creatinine clearance  
                               |                 | • $K^+ > 5.5$ mEq/L, discontinue drug |
| Decreased $Mg^{2+}$           | • Give OTC $Mg^+$ supplements |
| Hypertension (DBP>90 mmHg)    | • Common, easily controlled; monitor weekly  
                               |                 | • Use of calcium channel blockers, nifedipine (Adalat®, Procardia®) and felodipine (Plendil®) may help limit nephrotoxicity  
                               |                 | • No ACE inhibitors; may increase creatinine and decrease GFR  
                               |                 | • No thiazide diuretics |
| Increased CrCl >30%           | • Reduce CsA dose |
| Drug interactions             | • Some antibiotics, melphalan [Alkeran®], antifungals, NSAIDS, cimetidine [Tagamet®], ranitidine [Zantac®], tacrolimus [Prograf®], calcium channel blockers, methylprednisolone, anticonvulsants and others. |

<table>
<thead>
<tr>
<th>Side effects not requiring Tx</th>
<th>Management tips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paresthesias</td>
<td>• Educate patients; often transient; divide dose further to reduce peak CsA blood levels.</td>
</tr>
<tr>
<td>Gingival hyperplasia</td>
<td>• Good dental hygiene; consider adding retinoids</td>
</tr>
<tr>
<td>Hypertrichosis</td>
<td>• Hair removal methods</td>
</tr>
<tr>
<td>Acne</td>
<td>• Treat accordingly</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>• Not contraindicated in pregnant women, but has been associated with reduced birth weight and premature labor.</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>• Rarely requires treatment. If so, consider a statin such as atorvastatin.</td>
</tr>
<tr>
<td>Increased bilirubin, nausea,</td>
<td>• No treatment</td>
</tr>
<tr>
<td>headache, fatigue, myalgia</td>
<td></td>
</tr>
<tr>
<td>Increased uric acid</td>
<td>• Nothing unless symptomatic or has history of gout.</td>
</tr>
</tbody>
</table>

*HCTZ = hydrochlorothiazide*  
*GFR = glomerular filtration rate*
In one study, no patient treated for more than two years with cyclosporine had a normal kidney biopsy.64 Another renal biopsy study showed features of nephrotoxicity in six of eight patients treated with 1-6 mg/kg/day of cyclosporine for an average of five years.65,66 Irreversible kidney damage is extremely unlikely if dermatologic guidelines are followed.

- Malignancies, including skin cancers and lymphoma, have been reported in transplant patients on long-term, high-dose therapy.67-69 However, no increase in internal cancers, including lymphoma, has been seen in psoriasis patients treated according to the dermatologic guidelines. These guidelines, developed at an international consensus meeting, are as follows70:
  - Use CsA for no longer than two years at a time.
  - Keep serum creatinine increase to <30% of the pretreatment baseline creatinine.
  - Start at 2.5 mg/kg/day in BID divided doses. Based on patient response, increase up to a maximum of 5 mg/kg/day in BID divided doses.
  - If the patient is in a crisis and in need of rapid improvement, cyclosporine can be started at 4-5 mg/kg/day in BID divided doses.

Table 5-3 details the side effects of cyclosporine, drug interactions and corresponding management options.

**Clinical Pearls**
- When adding drugs that interact with cyclosporine, monitor blood pressure, renal function and clinical response.
- Cyclosporine should not be used for more than one year at a time, according to FDA recommendations.
  - International guidelines approve up to two years of continued use at a time.
  - If longer than one-year, uninterrupted use is contemplated, consider checking GFR annually (not required by international guidelines).
  - Rotate therapy if possible.
  - In patients with relative contraindications (older patients, diabetes or controlled hypertension), caution is advised when used for more than one year.
- Grapefruit juice can raise cyclosporine levels.
- Cyclosporine is usually given in two divided doses but may be given as a single daily dose. If the patient misses one of two daily doses, he/she can double up on the next dose.
Calcium channel blockers may limit nephrotoxicity.

**Methotrexate**
In the United States, methotrexate as treatment for psoriasis was originally approved in 1971. It is still one of the most effective therapies, particularly for psoriatic arthritis. It is also indicated for the management of severe erythrodermic and pustular psoriasis. However, it is hepatotoxic, teratogenic and immunosuppressive.

**Dosing**
- Consider test dose: 2.5 to 5.0 mg
- Average dose: 10 to 15 mg/week
- Maximum dose: 30 mg/week
- Upon improvement, taper by 2.5 mg every four weeks

**Table 5-4: Risk Factors for Liver Disease**

<table>
<thead>
<tr>
<th>Primary</th>
<th>Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of or current excessive alcohol abuse</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>Abnormal liver function test</td>
<td>Obesity</td>
</tr>
<tr>
<td>History of liver disease, including chronic hepatitis</td>
<td>Exposure to hepatotoxic drugs or chemicals</td>
</tr>
</tbody>
</table>

**Side Effects and Management Options**
- Hepatotoxicity. Liver biopsies were once advocated for all patients starting methotrexate. Biopsies are now advocated after a cumulative dose of 3.5 g in low-risk patients and 1.5 g in high-risk patients.\textsuperscript{71,72} Alternatively, consider switching to another agent or discontinuing therapy.
- Bone marrow suppression can be lethal, especially in elderly patients with impaired renal function.\textsuperscript{71,72} Additional risk factors include: renal insufficiency, lack of folate supplementation, medication errors, drug interactions, hypoalbuminemia and excess alcohol intake.
- Acute photosensitive reactions may follow dosing, especially in patients who developed burns during prior phototherapy.
- Lymphoma risk increased according to FDA “black-box” warning in PI, but scientific basis for this warning is debatable.

Table 5-5 details the side effects of methotrexate and corresponding management options.
### Table 5-5: Side Effects of Methotrexate and Management Options

<table>
<thead>
<tr>
<th>Side effects requiring therapy</th>
<th>Management tips</th>
</tr>
</thead>
</table>
| **Nausea** | 1-5 mg folic acid; do not give on day of MTX treatment due to possible reduction in efficacy  
Accupressure (e.g. Sea-Band® or similar device)  
Decrease or divide MTX dose  
Administer SQ or IM |
| **Aphthous stomatitis** | Check CBC  
Dose related and reversible: lower dose  
Add topical TX  
Folic acid, although it may reduce the efficacy  
Leucovorin-do not give on day MTX is given |
| **Increased LFTs** | Check LFTs 5-7 days after dose (see Table 5-6: WHO Guidelines for Liver Toxicity)  
Ask about alcohol, meds such as acetaminophen, ASA.  
Increased GGT and alkaline phosphatase not related to MTX  
Consider liver biopsy (see Table 5-7: Liver Biopsy Findings) |
| **Bone marrow suppression (decreased Hct, megaloblastic anemia)** | Monitor for drug interaction with NSAIDs, trimethorprim/sulfamethaxazole  
Lower MTX dose if symptomatic  
Folate, 5 mg/day |
| **Platelets** | Any sudden and/or significant reduction in platelet count from pre-treatment level, repeat CBC and platelet count in 1 week and consider reducing dose  
Considering lowering dose and repeat platelet count more often |
| **Platelets** | 100,000 to normal  
Reduce dose or discontinue MTX  
100,000 or less  
Discontinue MTX |

<table>
<thead>
<tr>
<th>Side effects requiring therapy</th>
<th>Management tips</th>
</tr>
</thead>
</table>
| **WBC** | Consider lowering dose and repeat WBC more often  
Reduce dose or discontinue MTX  
Discontinue MTX |
| **Pulmonary toxicity-acute pneumonitis** | Monitor for new cough  
Stop MTX; do chest X-ray immediately |
| **Pregnancy/reproduction contraindicated** | Men and women must be off MTX for 3 months before conception  
If women becomes pregnant during therapy, discontinue MTX  
If partner of man on MTX becomes pregnant, man stays on MTX, uses condoms, gets genetic counseling |
| **Important drug interactions** | Barbiturates, phenylbutazone, phentoin (Dilantin®), probenecid (Benemed®), salicylates and sulfonamides may raise free MTX levels  
NSAIDs, phenylbutazone, probencid, salicylates, sulfonamides, dipyridamole (Persentine®) increase half-life of MTX  
Trimethorprim (in Sepra® and Bactrim®) and MTX can cause severe bone marrow suppression and should be avoided |

WBC = white blood count
**Clinical Pearls**

- Give patients the risks of methotrexate in writing. The National Psoriasis Foundation brochure on systemic treatments is a convenient, free resource in this regard [www.psoriasis.org/severe/systemics](http://www.psoriasis.org/severe/systemics).

- Do not discontinue MTX abruptly, unless doing so is essential.

- Drug interactions are numerous. NSAIDs impair the excretion of MTX, causing bone marrow suppression, but the most lethal combination is MTX with trimethoprim/sulfamethoxazole.

- Use special care when prescribing for the elderly.

- The liquid formulation has a bioavailability similar to that of the tablets and is less expensive, but is more difficult to titrate for elderly patients with poor eyesight.

- Investigations into the use of non-invasive monitoring procedures—such as serologic markers of hepatic fibrosis including serum aminoterminal propeptide of type III procollagen (PIIINP)—may help reduce the need for biopsies.

**Table 5-6: WHO Guidelines for Liver Toxicity**

<table>
<thead>
<tr>
<th>Grade 0 toxicity (none)</th>
<th>• ALT/AST &lt;1.25x normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1 (mild)</td>
<td>• ALT/AST 1.26-2.5x normal; re-check in 2-4 weeks</td>
</tr>
<tr>
<td>Grade 2 (moderate)</td>
<td>• ALT/AST 2.6-5x normal; lower MTX dose</td>
</tr>
<tr>
<td>Grade 3 (severe)</td>
<td>• ALT/AST 5.1-10x normal; stop MTX and re-check in 2 weeks</td>
</tr>
<tr>
<td>Grade 4 (life-threatening)</td>
<td>• ALT/AST &gt;10x normal; stop MTX, life-threatening</td>
</tr>
</tbody>
</table>

*ALT = alanine aminotransferase, AST = aspartate aminotransferase*

**Table 5-7: Liver Biopsy Findings**

| Grade I (normal; mild fatty infiltration, nuclear variability, portal hypertension) | • Continue MTX |
| Grade II (moderate-severe; fatty infiltration, nuclear variability, portal tract inflammation) | • Continue MTX; these changes are relatively common pre-therapy |
| Grade IIIA (mild fibrosis) | • May continue MTX; repeat biopsy in 6 months |
| Grade IIIB (moderate-severe fibrosis) | • Discontinue MTX |
| Grade IV (cirrhosis) | • Discontinue MTX |
Biologics

Adalimumab *(Humira®)*

Adalimumab inhibits tumor necrosis factor-alpha (TNF-alpha), a key inflammatory cytokine. It is FDA-approved for psoriasis, psoriatic arthritis, and rheumatoid arthritis. Adalimumab is a recombinant IgG1 monoclonal antibody that binds to TNF-alpha. Adalimumab also lyses surface TNF-expressing cells in vitro in the presence of complement. In clinical trials, 53-80% of patients achieved PASI 75 with doses of 40 mg every other week and 40 mg every week, respectively.73

**Dosing**

In psoriasis, two doses have been tested: an 80-mg loading dose followed by 40 mg every other week or an 80-mg loading dose weekly for two weeks followed by 40 mg weekly.

Dosing can be increased to 40 mg weekly in some patients depending on the response to treatment.

**Side Effects**

- Use of TNF inhibitors has been associated with increased risk of infection, heart failure and lymphoma. The apparent increase in lymphoma may be due to increased risk of lymphoma in the treated population (rheumatoid arthritis patients).

- New onset or exacerbation of demyelinating disorders.

- Development of positive antinuclear antibodies is not uncommon. Developments of lupus-like syndromes occur rarely in patients treated with TNF inhibitors.

- Injection site reaction. These are generally well tolerated.

- Anaphylaxis.

- Pregnancy Category B.

**Clinical Pearls**

- In rheumatoid arthritis patients, no adjustment in dosing appears to be needed when taking adalimumab and methotrexate concurrently.

- Patients should not receive live vaccinations while on adalimumab.

**Monitoring Information**

Test for TB (PPD or QuantiFERON®-TB Gold test) before initiation of treatment.

**Alefacept (Amevive®)**

Alefacept is FDA-approved for the treatment of adults (over age 18) with chronic moderate to severe plaque psoriasis who are candidates for systemic therapy or phototherapy. Alefacept is a human fusion protein—obtained by recombinant DNA technology—that modulates the activity of T cells. Alefacept appears to selectively deplete activated T cells, and its use seems to result in long periods of remission in some patients. Since it targets T cells,
T-cell counts decrease during therapy and should be monitored. In clinical trials, 15-25% of patients achieve PASI 75 at 14 weeks (two weeks after completion of the first 12-week course), with substantially more patients achieving PASI 75 later and after subsequent courses.

**Dosing**
Recommended dosing is a once-weekly 15-mg intramuscular injection for 12 weeks (IV injection of 7.5 mg/week has also been studied). Additional 12-week cycles of weekly injections may be started as long as the CD4 lymphocyte counts are within normal limits, and a 12-week interval has passed since the prior course of therapy.

**Side Effects**
- Frequently reported adverse effects include pharyngitis, dizziness, increased cough, nausea, pruritus, myalgias, chills, injection site pain, and injection-site inflammation.
- Alefacept reduces circulating CD4 and CD8 lymphocytes. Therefore, there is potential risk of infection and malignancy.

**Clinical Pearls**
- Alefacept should not be given to patients with clinically significant infections. Discontinue alefacept if serious infection, malignancy, or clinically significant signs of liver injury occurs.
- Increased duration of use (up to 16 consecutive weeks) appears to increase efficacy and was well-tolerated in a small trial.
- Increased benefit noted when given with UVB during first six weeks of alefacept therapy.
- Pregnancy Category B.
- No known drug interactions.
- Live or live-attenuated vaccines should not be given concurrently with alefacept. Non-live vaccines can be given but for maximal protection should be given before alefacept is started.

**Monitoring Information**
CD4 lymphocyte counts should be monitored every other week during the 12-dose regimen and used to guide dosing (withhold dosing if CD4 lymphocyte counts fall below 250 cells/µL). Discontinue if CD4 counts remain <250 cells/µL for one month.

**Etanercept (Enbrel®)**
Etanercept is FDA-approved for treatment of adult patients with chronic moderate to severe plaque psoriasis and psoriatic arthritis. Other FDA-approved indications include ankylosing spondylitis, polyarticular-course juvenile rheumatoid arthritis, and moderate to severe rheumatoid arthritis. Etanercept is a fusion protein consisting of tumor necrosis factor-alpha (TNF-alpha) receptor components bound to
the Fc portion of IgG. Etanercept binds and inactivates TNF-alpha. In phase III studies of psoriasis patients, about 30% of patients treated with 25 mg twice a week and nearly 50% of patients treated with 50 mg twice a week had 75% improvement in PASI (PASI 75) after 12 weeks of treatment.\textsuperscript{78,79}

**Dosing**

For plaque psoriasis, 50 mg SQ is given once or twice weekly for three months followed by a maintenance dose of 50 mg once weekly. The approved dose is 50 mg SQ weekly for psoriatic arthritis. Rotate sites for injection (thigh, abdomen, upper arm). Do not inject in areas where skin is tender, bruised, red or hard.

Dosing can be increased up to 50 mg 2x weekly in some patients based on response to treatment.

**Side Effects**

- Mild to moderate injection site reactions are the most common side effect. They are generally well-tolerated and can be treated symptomatically. They do not require discontinuation of treatment.

- There is likely some increased risk of infection and malignancy. Increased risk of lymphoma has been observed, but that may be due to the increased risk of lymphoma in the population of patients in which etanercept has been used (primarily rheumatoid arthritis patients).

- Demyelinating disorders such as transverse myelitis, optic neuritis, multiple sclerosis and seizure disorder have been associated with TNF inhibitors and these agents should be avoided in patients with demyelinating disorders.

- Rare cases of pancytopenia including aplastic anemia have been reported.

- There have been reports of new onset and worsening congestive heart failure while on etanercept.

- Treatment with etanercept has been associated with development of antinuclear antibodies and rarely can be associated with a lupus-like syndrome.

- Pregnancy Category B.

**Clinical Pearls**

- Concurrent therapy with anakinra is not recommended due to increased risk of infection.

- Patients should not receive live vaccinations while on etanercept.

- There is no need to alter methotrexate dosing when used concurrently with etanercept, based on experience in rheumatoid arthritis patients.

**Monitoring Information**

Testing for tuberculosis (PPD or QuantiFERON\textsuperscript{®}-TB Gold test) is required. If positive, a chest X-ray may be needed.
**Golimumab** [Simponi®]
Golimumab is a fully human IgG monoclonal antibody with specificity for TNF-alpha that is FDA-approved for the treatment of active psoriatic arthritis alone or in combination with methotrexate. Other FDA-approved indications include active moderate-to-severe rheumatoid arthritis (in combination with methotrexate) and active ankylosing spondylitis.

In the pivotal phase III clinical trial of golimumab in patients with active psoriatic arthritis, 51% of patients treated with 50 mg every 4 weeks and 45% of patients treated with 100 mg every 4 weeks achieved a 20% improvement in the American College of Rheumatology criteria (ACR20) response at week 14, compared to 9% of patients in the placebo control group. Patients in the same study with psoriasis affecting 3% or more of their body surface area were also evaluated for changes in the Psoriasis Area and Severity Index (PASI) score. At week 14, 40% of the patients receiving 50 mg and 58% of the patients receiving 100 mg of golimumab achieved a PASI 75 compared to 3% of the placebo-treated patients.

**Dosing**
Golimumab is administered in doses of 50 mg by subcutaneous injection once per month. It may be given alone or in combination with methotrexate.

**Side effects**
- Use of TNF inhibitors has been associated with increased risk for infection, heart failure and lymphoma. The apparent increase in lymphoma may be due to increased underlying risk of lymphoma in the treated population (rheumatoid arthritis patients).
- New onset or exacerbation of demyelinating disorders.
- Development of positive antinuclear antibodies is not uncommon. Development of lupus-like syndromes occurs rarely in patients treated with TNF inhibitors.
- Injection site reaction. These are generally well-tolerated.
- Anaphylaxis.
- Pregnancy category B.

**Clinical pearls**
- Patients should not receive live vaccinations while on golimumab.
- Not to be used in combination with Abatacept or Anakinra.

**Monitoring Information**
Test for TB (PPD or QuantiFERON®-TB Gold test).

**Infliximab** [Remicade®]
Infliximab, also a TNF-alpha inhibitor, is a monoclonal antibody currently used to treat psoriasis, psoriatic arthritis, Crohn's disease, rheumatoid arthritis and ankylosing spondylitis.
The safety and efficacy of infliximab was assessed in three randomized, double-blind placebo controlled studies. In the pivotal EXPRESS II study of 835 patients, 75% of the 5 mg/kg group achieved a PASI 75 compared to 2% of the placebo group at week 10.82

**Dosing**

Infliximab is used in doses of 5 mg/kg infusions at 0, 2 and 6 weeks, then every 8 weeks. Patients should be observed for side effects for at least one hour after infusion. Appropriate staff, medication and emergency equipment should be available for managing possible infusion reactions.

Dosing can be increased up to 10 mg/kg or the frequency increased up to every four weeks.

**Side Effects**

- Acute infusion reactions can develop immediately or within a few hours.

- A delayed hypersensitivity reaction (myalgia, arthralgia with fever, rash, pruritus, edema, dysphagia, urticaria, sore throat, and headache) may occur. This has been observed most commonly in patients with Crohn’s disease with re-administration of infliximab after a drug-free interval of two to four years following a previous infusion.

- There is likely some increased risk of infection and malignancy. Increased risk of lymphoma has been observed, but that may be due to the increased risk of lymphoma in the population of patients in which infliximab has been used (primarily rheumatoid arthritis patients).

- Demyelinating disorders such as transverse myelitis, optic neuritis, multiple sclerosis, and seizure disorder have been associated with TNF inhibitors and these agents should not be used in patients with demyelinating disorders.

- Rare cases of pancytopenia including aplastic anemia have been reported.

- There have been reports of new onset and worsening congestive heart failure while on infliximab.

- Treatment with infliximab has been associated with development of antinuclear antibodies and rarely can be associated with a lupus-like syndrome.

- Pregnancy Category B.

**Clinical Pearls**

- Formation of antibodies to infliximab may be reduced when the drug is given at regular intervals and when used concurrently with methotrexate, azathioprine or 6-mercaptopurine.

- Patients should not receive live vaccinations while on infliximab.
Monitoring Information
• Test for TB (PPD or QuantiFERON®-TB Gold test) before initiation of treatment.

• Liver function tests should be monitored periodically. If >5 times the upper limit of normal, the dose should be withheld until LFTs are lower.

• Patients should be observed for side effects for at least one hour after infusion. Appropriate staff, medication and emergency equipment should be available for managing possible infusion reactions.

Ustekinumab (Stelara®)
Ustekinumab is a monoclonal antibody directed against the p40 subunit of IL-12 and IL-23, thus blocking the interaction between those cytokines and their respective receptors. In pivotal trials, patients were treated with either 45 mg or 90 mg of ustekinumab or placebo at weeks 0, 4, and every 12 weeks thereafter. PASI 75 was achieved by 67% of patients treated with the 45-mg dose of ustekinumab and 76% of the patients treated with the 90-mg dose. Even higher response rates were achieved at week 28.83,84

Dosing
For patients weighing less than 100 kg (220 lb.) it is recommended that they receive 45 mg at weeks 0, 4 and then every 12 weeks thereafter. Those weighing more than 100 kg should be given 90 mg also at 0 and 4 weeks followed by a 90-mg dose every 12 weeks. For those who do not achieve adequate responses, dosing as often as every 8 weeks has been shown to be effective.84

Side Effects
• While no clear pattern of ustekinumab-specific side effects emerged in clinical trials, this drug targets the immune system. Consequently, patients should be cautioned about risk of infection and malignancy. It is not known whether patients taking this medication may be at increased risk of salmonella and mycobacterial infections. Diagnostic evaluation should be considered if suggested by symptoms. There has been one case of reversible posterior leukoencephalopathy syndrome which has been reported that resolved with drug cessation.

Clinical Pearls
• Efficacy of ustekinumab is inversely related to the patient’s weight. Consequently, the higher 90 mg dose should be administered to patients weighing 100 kg or more.

• Patients should not receive live vaccinations while on ustekinumab

Monitoring Information
• Test for TB before initiating treatment.
**Unapproved Agents**

**Hydroxyurea (Hydrea®)**

Hydroxyurea is an anti-metabolite that has been used to treat psoriasis for 30 years. It is effective as monotherapy, although about one-third of patients whose psoriasis improves develop bone marrow toxicity with leucopenia, thrombocytopenia or megaloblastic anemia. Although bone marrow suppression is usually mild and does not necessitate the discontinuation of therapy, it may occasionally be severe.

**Dosing**

- Initial dose: 1 g PO/day (ie, 500 mg PO BID).

- If no response, increase by 500 mg daily increments every month, up to 2.0 g/day.

**Side Effects**

- Cutaneous reactions may be seen in some patients.

- Long-term therapy may cause skin or leg ulcers.

**Clinical Pearls**

- Narrow therapeutic index.

- Useful in combination therapy, and for recalcitrant palmoplantar psoriasis.

- Of value in HIV-related psoriasis.

- After increasing dose, repeat CBC and platelet counts weekly. Once the dose is stable, CBC should be repeated every 1-3 months. Hold dosage if WBC is <2,500 or platelet count is <100,000.

**Mycophenolate Mofetil (CellCept®)**

Mycophenolate mofetil has been used to prevent organ transplant rejection and has proven effective in the treatment of several inflammatory or autoimmune skin disorders. In the 1970s it was investigated for the treatment of psoriasis; many patients had long-term remissions. Side effects were tolerable.

**Dosing**

- 500 mg PO 4 times/day based on clinical response.

- May be increased or reduced by 250 mg/day each month up to a maximum of 4.0 g/day.

**Side Effects**

- Nausea, vomiting, diarrhea.

- Herpes zoster and herpes simplex occurred in more than 31% of patients in one study.

**Clinical Pearls**

- Can be administered with CsA and is useful when tapering CsA.

- Since it is an immunosuppressive agent, patients should be followed to ensure that they do not develop opportunistic infections. It should not be given to patients with severe infections or untreated malignancies.
6-Thioguanine
6-Thioguanine is a purine analog that interferes with nucleic acid synthesis. It is an analog of the nucleic acid guanine and is closely related to mercaptopurine (Purinethol®). It is indicated for the treatment of acute nonlymphocytic leukemia and other neoplasms, but in a study by Silvis and Levine, it helped 71% of patients (10/14) clear >75% of psoriasis-affected areas.89

**Dosing**
- **Starting dose:** 80 to 100 mg PO twice weekly
- **Increase by 20 mg every 2 to 4 weeks**
- **Maximum dose:** 160 mg PO 3 times a week

**Side Effects**
- Bone marrow suppression
- GI complaints: nausea and diarrhea
- Elevation of LFTs is common
CHAPTER 6: TRANSITIONAL STRATEGIES FOR SWITCHING THERAPY

Once a patient’s psoriasis is adequately controlled, the therapeutic regimen that was used for clearing can be slowly tapered to the minimal effective dose and used in combination with another agent, or the patient can be transitioned to a less toxic therapy to maintain long-term control. In addition, a sequential or rotational schedule may be used to maintain the patient in a state of remission.

Topical therapy, UVB and acitretin are the safest modalities for long-term use. TNF inhibitors also appear to be safe treatments for long-term use, as they are not associated with the cumulative organ toxicity associated with methotrexate and cyclosporine. When possible, they should be used for the maintenance phase of therapy. In sequential or rotational strategy, the skillfulness of the clinician in making a smooth transition from one regimen to another is critical for the overall therapeutic success. Details of several different transitions and combinations are contained in Table 6-1.
### Table 6-1: Transitional Issues

<table>
<thead>
<tr>
<th>Drugs being added or deleted</th>
<th>Issue during transition</th>
<th>Therapy time/Dose limit</th>
</tr>
</thead>
</table>
| Transitioning from MTX to acitretin (4-5 month period) | • Use full doses of both and taper MTX as patients improve or  
• Taper MTX slowly (2.5 mg every 4 weeks) while introducing acitretin  
• Monitor LFTs every week when starting combination tx | MTX: rotate after cumulative dose of 3.5 g in low-risk patients; 1.5 g in high-risk patients or obtain liver biopsy  
Acitretin: no limit |
| Transitioning from MTX to CsA | • Decrease MTX or discontinue abruptly; add CsA 2.5 to 5.0 mg/kg/day  
• Increase frequency of CBC, PLT and creatinine monitoring | MTX: rotate after cumulative dose of 3.5 g in low-risk patients; 1.5 g in high-risk patients or obtain liver biopsy  
CsA: 1-2 years of continuous tx at a time |
| Adding MTX or CsA to acitretin | • Add full dose of MTX or CsA  
• With MTX: monitor LFTs and CBC weekly at first  
• With CsA: monitor renal function and lipids weekly at first | MTX: rotate after cumulative dose of 3.5 g in low-risk patients; 1.5 g in high-risk patients or obtain liver biopsy  
CsA: 1-2 years of continuous tx at a time |
| Adding acitretin to phototherapy | • Decrease UVB or UVA dose by 50%  
• Use low-dose acitretin (25 mg/day or every other day) | Acitretin and phototherapy: no limit |
| Adding TNF inhibitor to systemic treatment | • Add the TNF inhibitor at the full/standard dose  
• Taper systemic treatment once adequate disease control is achieved | TNF inhibitors can be used in combination with other systemic treatments with no known time-limitations |
| Adding acitretin or methotrexate to TNF inhibitors | • Add the oral systemic medication using the normal dosing schedule  
• Once adequate disease control is achieved, the combination can be continued  
• Alternatively, the TNF inhibitor can be withdrawn or the dose of the of the oral systemic medication can be tapered | TNF inhibitors can be used in combination with oral psoriasis treatments with no known time-limitations |

*PLT = platelets*
Medical Professionals and the National Psoriasis Foundation—teaming up to make a difference
CHAPTER 7: MEDICAL PROFESSIONALS AND THE NATIONAL PSORIASIS FOUNDATION—TEAMING UP TO MAKE A DIFFERENCE

Who We Are
Welcome to the National Psoriasis Foundation, the world’s largest nonprofit patient-advocacy organization dedicated to fighting psoriasis and psoriatic arthritis and the voice for millions of Americans who are affected by these diseases. Our mission is to find a cure for psoriasis and psoriatic arthritis and to eliminate their devastating effects through research, advocacy and education.

As a medical professional, you are a key contributor to the well-being of psoriasis/psoriatic arthritis patients. Our Professional Membership Program is specifically designed for dermatologists and rheumatologists, nurse practitioners, physician assistants, nurses and other medical specialists who are committed to the highest quality of care for patients with psoriatic diseases.

The Psoriasis Foundation is supported and advised by a volunteer Medical Board composed of thought leaders in the fields of dermatology and rheumatology. We also have a thriving relationship with medical professionals nationwide who help support our ability to achieve our mission.

When you join the Psoriasis Foundation as a professional member, you are supporting our efforts on behalf of the psoriasis
Send your patients to our Web site. Most of our publications can be downloaded at www.psoriasis.org. The site offers comprehensive information on psoriasis and psoriatic arthritis, treatment news, advocacy services, resources and ways to connect with others who have psoriasis.

The site offers

- Literature
  - Research shows that patients who are well-informed about their disease are more compliant with treatments and have better treatment results and are more satisfied than those who lack information. Tell your patients who lack information that will help them manage their disease.
  - When you become a professional member, we can provide you with comprehensive, practical treatment advice from leading experts in the field.

- Educational Booklets: The Psoriasis Foundation publishes educational booklets for psoriasis and psoriatic arthritis education. These booklets cover subjects ranging from biologic medications to phototherapy options. We also publish four youth-oriented booklets for patients.
  - As a professional member, you will receive three copies of each quarterly issue to share with your patients and staff.

- PSORIASIS ADVANCE: Our magazine for Foundation members, published four times a year, offers news, articles, and columns about psoriasis and psoriatic arthritis. As a professional member, you will receive three copies of each quarterly issue to share with your patients and staff.

- PSORIASIS FORUM: This quarterly, peer-reviewed journal, offers practical treatment advice from leading experts in the field.

- WEB SITE:
  - Send your patients to our Web site. Most of our publications can be downloaded at www.psoriasis.org.

- National Psoriasis Foundation Community: You also receive tangible benefits that help you provide for your patients’ needs and keep you up to date on the latest treatments.

- Literature
  - Research shows that patients who are well-informed about their disease are more compliant with treatments and have better treatment results and are more satisfied than those who lack information. Tell your patients who lack information that will help them manage their disease.
  - When you become a professional member, we can provide you with comprehensive, practical treatment advice from leading experts in the field.

- Educational Booklets: The Psoriasis Foundation publishes educational booklets for psoriasis and psoriatic arthritis education. These booklets cover subjects ranging from biologic medications to phototherapy options. We also publish four youth-oriented booklets for patients.
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- PSORIASIS ADVANCE: Our magazine for Foundation members, published four times a year, offers news, articles, and columns about psoriasis and psoriatic arthritis. As a professional member, you will receive three copies of each quarterly issue to share with your patients and staff.

- PSORIASIS FORUM: This quarterly, peer-reviewed journal, offers practical treatment advice from leading experts in the field.
Insurance Advocacy

Insurance challenges can be a barrier to appropriate patient care. We have the resources to help. The Psoriasis Foundation’s advocacy department offers direct assistance for patients and medical professionals dealing with insurers. We make it easier to advocate for patients to navigate today’s managed health care system by providing steps to appeal insurance denials, sample letters from medical professionals on patients’ behalf, and research citations to support appeals.

The National Psoriasis Foundation also provides resources to help patients work with insurance companies to improve treatment coverage and to access financial assistance with out-of-pocket costs.

The Foundation has conducted an audit of more than a hundred health insurance plans nationwide and continues to identify problematic policies to target for improved access to treatment. The Psoriasis Foundation initiates dialogue and negotiations with insurers, and works in partnership with health professionals to identify and implement more patient-centered policies. In fact, in one year alone, these efforts improved access to treatments for nearly 400,000 patients across the country with moderate to severe psoriasis. We encourage the medical community to let our advocacy department know about policies that pose treatment barriers and to involve us in the appeals process when we can help.

The Psoriasis Foundation conducts public policy advocacy and education through state and federal legislative initiatives. Our priorities are to build greater federal investment in psoriasis research, improve access to treatments and move faster toward a cure. By educating policymakers and through legislative action and grassroots activity, we know it is possible to strengthen and expand psoriasis research and access to care, and that a cure is on the horizon.

For more information or to submit an insurance policy for investigation, call 503.546.5550, e-mail advocacy@psoriasis.org or fax us at 503.245.0626.

Medical Education

The National Psoriasis Foundation is committed to enhancing psoriasis treatment standards. We produce targeted professional education programs and tools, including:

- **CHIEF RESIDENTS MEETING.** This annual day-and-a-half meeting offers dermatology chief residents a comprehensive overview of treatments and management of psoriasis and psoriatic arthritis. Participants’ evaluations consistently rank the event as a highlight of their training.
Continuing Medical Education that focuses on treating psoriasis and psoriatic arthritis.

“Therapy of Moderate to Severe Psoriasis,” a clinical manual edited by Gerald D. Weinstein, M.D., and Alice B. Gottlieb, M.D., Ph.D., includes information from national psoriasis experts on state-of-the-art clinical management.

“The Psoriasis and Psoriatic Arthritis Pocket Guide,” published by the Psoriasis Foundation, includes algorithms that provide direction on the medical management of psoriasis, based on specific patient types.

Online Physician Directory

As a professional member, you’ll receive placement in our online Physician Directory, which allows physicians treating psoriasis and psoriatic arthritis to list their practices, indicate specific treatments offered and share other key details with patients. The directory, searched by more than 52,000 patients annually, helps match psoriasis and psoriatic arthritis patients with the best medical care in their area. To access the directory and list your practice, visit www.psoriasis.org/medical/directory.

Join Hands with Us

The Psoriasis Foundation maintains a strong relationship with the medical community. Hundreds of Foundation members are medical professionals committed to providing the best possible care for psoriasis and psoriatic arthritis patients. Please join us as a professional member and become part of a growing base of physicians and health care providers who are playing a vital role in the Psoriasis Foundation’s research, advocacy and education efforts. Together we can make a difference.

Benefits of Professional Membership

The annual fee for professional membership is $95 ($125 outside of the United States). Membership is open to all medical professionals. You’ll receive:

- Four issues annually of Psoriasis Forum, our peer-reviewed journal that provides practical treatment advice from leading experts.
- Discounted patient education literature.
- Placement in our online Physician Directory, where patients can easily find your practice.
- Three copies of each issue of Psoriasis Advance, the Foundation’s quarterly member magazine, to share with patients and staff.
To join online, visit www.psoriasis.org/promember. To receive information, call 800.723.9166 or e-mail member@psoriasis.org.

A Year in the Life of the National Psoriasis Foundation

- Circulate 65,000 educational booklets
- Circulate 100,000 copies of our member magazine, Psoriasis Advance
- Educate 117,000 visitors a month on our Web site
- Educate 5,000 patients about psoriasis and psoriatic arthritis via telephone and e-mail
- Deliver community education meetings to 1,000 people
- Circulate 10,000 copies of the medical professional journal, Psoriasis Forum
- Work with 500 volunteers across the country
- Present Webcast psoriasis education sessions to 1,000 people
- Bring 250 patients, families, volunteers and manufacturers together at our national conference
REFERENCES


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The mission of the National Psoriasis Foundation is to find a cure for psoriasis and psoriatic arthritis and to eliminate their devastating effects through research, advocacy and education.

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