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EDUCATIONAL OBJECTIVES

GOAL: To discuss the role of pharmacist interventions in improving the quality of life for patients with psoriasis and psoriatic arthritis

After participating in this activity, pharmacists will be able to:

- > Discuss the human and economic burden of psoriasis/psoriatic arthritis (PsA)
- > Identify areas in which practitioners are least likely to follow guidelines, and encourage adherence
- > Outline the pharmacist's role in identifying patients who have diagnosed or undiagnosed psoriasis or PsA, and key counseling points
- > Apply knowledge to determine when patients may be considered under-treated and when/how to engage the clinical team
- > List available options for treatment, adverse effects, risks and benefits

After participating in this activity, pharmacy technicians will be able to:

- > Recall the basic signs and symptoms of psoriasis and PsA
- > List reputable sources for patient information about psoriasis and PsA
- > Identify medications that are used routinely to treat psoriasis and PsA
- > Determine when to refer patients to the pharmacist for counseling or advice



The University of Connecticut School of Pharmacy is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.

Pharmacists and pharmacy technicians are eligible to participate in the application-based activity, and will receive up to 0.2 CEUs (2 contact hours) for completing the activity, passing the quiz with a grade of 70% or better, and completing an online evaluation. Statements of credit are available via the CPE Monitor online system and your participation will be recorded with CPE Monitor within 72 hours of submission.

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Interventions to improve quality of life for patients with psoriasis and psoriatic arthritis

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Abstract

Psoriasis is an autoimmune disorder of the skin with multiple classifications, including psoriatic arthritis (PsA). As a disease without a cure, psoriasis requires lifelong treatment focusing on disease-specific and psychosocial therapy. Unfortunately, psoriasis and PsA have been associated with suboptimal therapy management, with many patients not receiving treatment at all or not receiving maximal therapy for the severity of the disease. This suboptimal treatment compounded by high out-of-pocket costs, especially for targeted biologic agents, and lack of access to therapy has caused high rates of patient dissatisfaction with their therapy. In addition to high costs, therapy may involve potentially complex and time-intensive topical regimens, and many of the newer systemic therapies are associated with adverse effects, further increasing the rate of nonadherence. Pharmacists are in a unique position to promote adherence to therapy and to encourage the appropriate management of psoriasis.

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IMAGE: GETTY IMAGES / TINA LOREN

Introduction

Psoriasis is a broad term used to describe autoimmune disorders of the skin that are characterized by an increased growth cycle of skin cells, resulting in the buildup of lesions. Psoriasis can be further sub-classified by type, such as plaque psoriasis (psoriasis vulgaris), the most common subtype, and psoriatic arthritis (PsA). Together, psoriasis and PsA are known as psoriatic disease.¹ As a chronic inflammatory condition, psoriasis requires lifelong treatment that carries both a physical and emotional burden to the patient, much like other chronic disease states such as hypertension, diabetes, and depression.² As such, many patients are suboptimally treated. As many as 49.2% of patients with mild, 35.5% with moderate, and 29.7% with severe psoriasis lack treatment, and many of the patients who do receive treatment are treated inadequately; approximately half of those with psoriasis and PsA (52.3% and 45.5%, respectively) report being dissatisfied with their treatment.³ Furthermore, treatment is complicated by lack of proper patient counseling leading to discontinuation of therapies, as well as provider concerns about the long-term safety and efficacy of treatment options and barriers with insurance coverage.⁴⁻⁷ As medication experts, pharmacists are well placed to educate both patients and providers on various treatment options for psoriasis

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in regard to safety, efficacy, and cost.

Epidemiology/pathophysiology

Affecting approximately 7.5 million adults, or approximately 2% of the U.S. population, psoriasis is considered a common autoimmune disorder.⁸ Psoriasis affects men and women equally and has a bimodal onset. It can occur at any age but most commonly develops during adolescence to young adulthood (ages 15-35 years), with another peak onset among patients in their early 50s.^{9,10} Psoriasis develops in response to a trigger and follows an unpredictable clinical course.¹¹ Although the exact cause of this disease is unknown, the etiology is believed to be multifactorial, including genetic, environmental, and immunogenic causes. Genetics and the immune system play a large role, with approximately 33% of those diagnosed having a first-degree relative also afflicted with the condition.¹²

PsA, a seronegative inflammatory

ment of T cells in the epidermis, resulting in keratinocyte proliferation. An increase in cell cycle turnover from 23 days to three to five days is responsible for the development of the characteristic skin lesions.^{14,15} Activation of the inflammatory process further leads to the production of various cytokines such as tumor necrosis factor- α (TNF- α), interleukin-12 (IL-12), and pro-inflammatory mediators such as IL-17 and IL-23.¹⁶ As this disease process has become more clearly understood, biologics that better target the underlying pathophysiology have been developed. Unfortunately, biologics remain underused, especially in patients with moderate to severe disease.³

Risk factors

With advancements in genetic testing and medical technology, 25 gene variants have been identified that increase the risk of a patient developing psoriasis.⁹ Specifically, psoriasis has been associated with the human leukocyte

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How often do you help patients save money on prescriptions by referring them to patient assistance programs?

arthritis with a varying clinical presentation, typically develops approximately 12 years after the first occurrence of psoriatic skin lesions. As with psoriasis, PsA affects men and women equally. This condition occurs in 6% to 42% of patients with psoriasis.¹³ This wide range highlights the significance of underdiagnosis of PsA, which in turn has resulted in undertreatment.

The pathophysiology of psoriasis is complex and until recently had not been well understood because of a lack of an animal model for research, which forced researchers to rely on clinical studies and translational science in patients with the disorder.¹⁴ Now it is known that once triggered, immune modulators and inflammatory components activate the sequelae of the disease. Specifically, leukocytes are responsible for the recruit-

ment of T cells in the epidermis, resulting in keratinocyte proliferation. An increase in cell cycle turnover from 23 days to three to five days is responsible for the development of the characteristic skin lesions.¹⁴ In addition to this known genetic component, various triggers can also lead to the development or exacerbation of psoriasis. Triggers vary from person to person but may include environmental factors such as stress, direct injury or trauma to the skin (known as the Koebner phenomenon), cold weather, use or withdrawal from certain medications (use of lithium, antimalarials, propranolol, or nonsteroidal anti-inflammatory agents [NSAIDs]; withdrawal from oral steroids), and infection (most notably Streptococcus infection).^{9,10} Lifestyle choices such as smoking, obesity, and alcohol use have also been associated with an increased risk of psoriasis and disease severity; however, no direct causation has been demonstrated.¹²

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Presentation

Plaque psoriasis manifests as bilateral symmetrical papules that progress to thick red patches often covered by silvery scales and commonly located on the elbows, knees, low back, face, palms, and soles of the feet.^{9,10} Skin patches, or lesions, may occur suddenly or worsen over time and are often preceded by a recent infection (eg, strep throat, viral infections including HIV), trauma, or the use of certain medications. Skin lesions may be characterized by pain, pruritus, and/or erythema. The nails and eyes may also be affected. Signs of nail involvement includes onycholysis (or when the nail pulls away from the nail bed), pitting, discoloration, and dystrophy. Ocular signs and symptoms occur in approximately 10% of those with psoriasis and include symptoms that commonly occur with conjunctivitis or blepharitis, such as redness and tearing.¹⁵ PsA is characterized by inflammation, stiffness, and pain in and around the distal joints of the fingers, toes, wrists, ankles, and knees.^{9,15} Risk factors for the development of PsA include psoriasis as well as environmental exposures and genetics. The Classification Criteria for Psoriatic Arthritis (**Table 1**) are used to diagnose PsA with high sensitivity and specificity (98.7% and 91.4%, respectively).¹⁷

The visibility of plaques can cause undue stress and poor self-esteem, resulting in a significant effect on mental health, including comorbid depression, anxiety, sexual dysfunction, and thoughts of suicide.^{12,18,19} Patients with psoriasis are also at increased risk for developing other immune-mediated comorbid conditions such as Crohn's disease and ulcerative colitis. Patients with a family history of multiple sclerosis are more likely to develop psoriasis. Other common comor-

bid conditions include obesity and cardiovascular disease, including myocardial infarctions and ischemic heart disease.¹²

Treatment

Psoriasis is a chronic disease without a cure that significantly affects quality of life (QoL); as such, treatment focuses on management of the physical aspects of the disease, as well as the psychosocial component. In one survey, 79% of patients felt that psoriasis decreased their QoL. Specifically, 75% felt unattract-

nail, and joint symptoms but also on QoL. It is important to discuss the reality of treatment goals such as a lack of complete symptom resolution, especially in patients receiving topical therapy alone.²¹ This review of therapy will address the management of healthy adults and will not cover aspects pertaining to special populations such as pediatric or pregnant patients.

The Canadian Dermatology Association, American Academy of Dermatology (AAD), and the National Institute of Health and Care Excellence (NICE) have written guidelines for the management of psoriasis.^{18,22,23} Although some nonpharmacologic treatment modalities such as acupuncture, smoking cessation, weight loss, and vitamin D supplementation have been used in this condition, evidence for these options is lacking, and

TABLE 1

Classification Criteria for Psoriatic Arthritis

ESTABLISHED ARTICULAR INFLAMMATION PLUS A SCORE OF AT LEAST 3 OF THE FOLLOWING:

Current psoriasis	2 points
Personal history of psoriasis	1 point
Dactylitis (current or history of)	1 point
Negative rheumatoid factor	1 point
Juxta-articular new bone formation on x-ray	1 point
Nail dystrophy	1 point
Family history of psoriasis (first- or second-degree relative)	1 point

Source: Refs 17

ive and more than 50% reported feelings of depression resulting in problems with work, socialization, and everyday activities.²⁰ Another study found that psoriasis negatively affects QoL as significantly as cancer, arthritis, hypertension, heart disease, diabetes, and depression.²

Given the disease burden and significant effect of psoriasis on mental health, clinicians and patients should discuss appropriate goals for therapy in terms of improvement and control of the disease, with a focus not only on skin,

therefore pharmacologic agents remain the mainstay of treatment.²⁴

Pharmacologic management depends on many factors, including patient preference, convenience, efficacy, presence of comorbid conditions, individual response, cost of therapy, areas affected, and disease severity. Disease severity can be classified as mild, moderate, or severe.

Disease of mild to moderate severity affects less than 5% of the body surface area (BSA) and excludes the hands,

feet, face, and genital areas.¹² Because most patients with psoriasis are diagnosed with mild to moderate disease severity, pharmacologic management in these patients consists primarily of topical therapy.

Severe disease is classified as disease that affects more than 5% of the BSA or involves the hands, feet, face, and genital areas. The primary treatment for severe disease consists of phototherapy in combination with systemic therapy. Patients with severe disease may require consultation with a dermatologist.¹²

Commonly used topical agents for the treatment of mild to moderate psoria-

sis include corticosteroids (or just “steroids”), vitamin D derivatives, retinoids, and calcineurin inhibitors. Less commonly used topical agents include salicylic acid, coal tar, and anthralin.¹² Topical steroids, the most commonly used topical therapy in the management of psoriasis, are available in a wide range of strengths (potency) and formulations. The potency of steroids ranges from “superpotent” to “least potent” (Table 2).^{10,25} Given the potential for adverse effects, use of steroids should be limited to the shortest duration possible, with consecutive use of no longer than three weeks unless directed by a physi-

cian. Although it is recommended that steroids be tapered down to avoid continual use, discontinuation of steroids often leads to recurrent lesions and symptoms. A systematic review found that the higher potency steroids, particularly very potent steroids, are more effective in clearing psoriatic lesions compared to other first-line topical treatment options but not without an increased risk of side effects.²⁶ For sensitive areas such as the face, neck, and skin-fold areas (under arms, breast, and groin area), lower-potency steroids are preferred.²⁵

The vitamin D derivatives, calcipotriene and calcitriol, can be used as monotherapy or in combination with other agents. These agents work to inhibit keratinocyte proliferation. In one study, calcipotriene was found to be as effective as potent steroids in improving size and severity of psoriatic lesions when used as monotherapy but was more effective in improving skin lesions when used in combination with topical steroids. Although generally well tolerated, the vitamin D derivatives can cause perilesional irritation, which is often alleviated when these agents are used in combination with steroids.^{26,27}

Tazarotene is a topical retinoid that also works to inhibit keratinocyte proliferation and normalize abnormal keratinocyte differentiation.²² Because of teratogenic concerns about this agent, its use is contraindicated during pregnancy, and caution should be used in those of child-bearing age. Female patients must have a negative pregnancy test within two weeks of initiating treatment and must be counseled to use two forms of birth control during treatment; patients must also be advised of the risks of becoming pregnant during treatment.²⁸ This agent is usually applied once daily, but because of its common side effects of itching, burning, and redness, every-other-day dosing may be warranted; alternatively, this agent can be used in combination with steroids or over-the-counter moisturizers. Although one study demonstrated similar efficacy between once-daily tazarotene 0.1% and 0.5% gel and

TABLE 2 Topical Corticosteroids^a

CLASS	EXAMPLES	MECHANISM OF ACTION	COMMON SIDE EFFECTS
1 (Superpotent)	Clobetasol propionate (shampoo, foam, ointment 0.05%); diflorasone diacetate (ointment 0.05%); fluocinonide (cream 0.1%)	Reduces inflammation	Hypopigmentation, striae, skin atrophy, tachyphylaxis, perilesional irritation
2 (Potent)	Augmented betamethasone (cream 0.05%); mometasone furoate (cream 0.1%); diflorasone diacetate (cream 0.05%); fluocinonide (cream, gel, ointment 0.05%)		
3 (Upper mid strength)	Fluticasone propionate (ointment 0.005%); fluocinonide (cream 0.05%); betamethasone valerate (foam 0.12%)		
4 (Mid strength)	Mometasone furoate (cream, lotion 0.1%); triamcinolone acetonide (cream, spray 0.1%); fluocinolone acetonide (ointment 0.025%); hydrocortisone valerate (ointment 0.2%)		
5 (Lower mid strength)	Fluticasone propionate (cream, lotion 0.05%); fluticasone acetone (shampoo 0.01%); desonide (lotion 0.05%); hydrocortisone butyrate (cream, lotion, ointment, solution 0.1%); hydrocortisone valerate (cream 0.2%)		
6 (Mild)	Desonide (foam, gel 0.05%); fluocinolone acetonide (solution 0.01%); alclometasone dipropionate (cream, ointment 0.05%)		
7 (Least potent)	Hydrocortisone (lotion 0.5%; cream, spray, ointment, lotion 1%; cream, lotion 2.5%)		

^aNot an all-inclusive list.

Source: Refs 10,25

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twice-daily fluocinonide 0.05% cream (success rates at week 12 were 65%, 52%, and 66%, respectively),²⁹ another study found significantly greater reductions in BSA involvement among patients receiving once-daily tazarotene 0.1% gel plus mometasone furoate 0.1% cream compared to patients receiving twice-daily calcipotriene 0.005% ointment ($P \leq 0.01$).³⁰ Thus, the AAD recommends that tazarotene be used in combination with topical steroids.³¹

Although the calcineurin inhibitors tacrolimus and pimecrolimus are not FDA approved for the use of psoriasis, they are commonly used off-label for the treatment of facial and intertriginous (or areas of skin fold such as under-arms, between fingers, or skin-folds under the breasts) psoriasis.³¹ Two double-blind, randomized, controlled trials demonstrated that tacrolimus significantly improved both facial and intertriginous psoriasis versus placebo (65.2% vs. 31.5%; $P < 0.0001$)

and pimecrolimus significantly improved intertriginous psoriasis versus placebo (71.4% vs. 21.7%; $P < 0.0001$).³² Although these agents are generally well tolerated with only mild side effects of burning and itching, calcineurin inhibitors carry a boxed warning regarding a potential risk for the development of lymphoma and melanoma.³³

Phototherapy may be considered as monotherapy, but patients with severe disease are often treated with a combination of phototherapy plus systemic therapy. Phototherapy consists of targeted excimer laser therapy, ultraviolet B (UVB) phototherapy, or ultraviolet A (UVA) photochemotherapy. Photochemotherapy consists of oral psoralen (a photosensitizer) followed by exposure to UVA.³¹ Although phototherapies help to clear plaques, oral psoralen plus UVA phototherapy has been shown to increase the rate of nonmelanoma skin cancer.²⁴

Systemic therapies used for the man-

agement of psoriasis include methotrexate, cyclosporine, acitretin, apremilast, and biologic agents. Despite its long-term use in psoriasis, methotrexate has limited evidence to support its efficacy, whereas a systematic review demonstrated that cyclosporine is effective and acitretin is moderately effective with a dose-dependent efficacy in patients with psoriasis.³⁴ The use of methotrexate, cyclosporine, and oral retinoids is limited by their toxicities, including myelosuppression, hepatotoxicity, nephrotoxicity, and teratogenicity.³⁵

Biologics have generally been reserved for cases of moderate to severe psoriasis and for the treatment of PsA (Table 3).^{36,37} However, their use has been increasing in recent years because they provide targeted therapy to the underlying pathophysiologic process of psoriasis. Biologics used for the treatment of psoriasis can be classified by their mechanism of action: TNF- α inhibitors and IL

TABLE 3

Biologics for the Management of Psoriasis and/or Psoriatic arthritis

MEDICATION	MECHANISM OF ACTION	INDICATION	ROUTE	MONITORING	SIDE EFFECTS	CONTRAINDICATION(S) ^a
Adalimumab	TNF- α inhibitor	Psoriasis; PsA	SubQ	TB screening; CBC and LFTs checked yearly	Headache, injection site reaction, URI	Previous serious hypersensitivity to adalimumab
Certolizumab	TNF- α inhibitor	PsA	SubQ		Rash, URI, UTI	None known
Etanercept	TNF- α inhibitor	Psoriasis; PsA	SubQ		URI, injection site reaction	Sepsis
Golimumab	TNF- α inhibitor	PsA	SubQ		URI, injection site reaction, nasopharyngitis	None known
Infliximab	TNF- α inhibitor	Psoriasis; PsA	IV		Abdominal pain, headache, URI	Do not use doses >5 mg/kg in cases of moderate to severe heart failure (NYHA III/IV); hypersensitivity to infliximab, to inactive components of infliximab, or to any murine proteins
Ixekizumab	IL-17a	Psoriasis	SubQ	Monitoring for hypersensitivity reactions and inflammatory bowel disease; TB screening	Fungal infection, injection site reaction, URI, nausea	Previous serious hypersensitivity to ixekizumab
Secukinumab	IL-17a	Psoriasis; PsA	SubQ		URI, cold symptoms, diarrhea	Previous serious hypersensitivity to secukinumab
Ustekinumab	IL-12/23	Psoriasis; PsA	SubQ	TB screening	Headache, fatigue, URI	Previous hypersensitivity to ustekinumab

Abbreviations: CBC, complete blood count; IL, interleukin; IV, intravenous; LFT, liver function test; NYHA, New York Heart Association; PsA, psoriatic arthritis; SubQ, subcutaneous; TB, tuberculosis; TNF, tumor necrosis factor; URI, upper respiratory tract infection; UTI, urinary tract infection. ^aSee full prescribing information regarding warnings and precautions of use. Source: Refs 36, 37

TABLE 4
Examples of Issues Affecting the Five Dimensions of Adherence

DIMENSIONS OF ADHERENCE	ISSUES
CONDITION	Severity of symptoms, degree of disability, severity of disease, comorbidities
HEALTH SYSTEM AND HEALTHCARE TEAM	Patient-provider relationship, training, consultation time, patient education and follow-up
PATIENT	Knowledge of illness, beliefs about illness, motivation, self-efficacy, forgetfulness, stress
SOCIOECONOMIC	Poverty, unemployment, education level, transportation, cost of therapy, cultural beliefs, social support
THERAPY	Regimen complexity, adverse effects, rate of improvements, duration of therapy

Source: Ref 40

inhibitors. The TNF- α inhibitors used in the management of psoriasis include: adalimumab, etanercept, and infliximab. The most recently approved IL-based agents include the IL-12/23 inhibitor ustekinumab and the IL-17a inhibitors ixekizumab and secukinumab.²²

Treatment for PsA differs based on various guidelines. The Group for Research and Assessment of Psoriasis and Psoriatic Arthritis guidelines recommend treatment options based on clinical presentation (eg, skin and nail disease, dactylitis [or “sausage-like” swelling of the fingers]) whereas the AAD guidelines use disease severity: mild, moderate, severe.^{13,38} Mild

secukinumab, and ustekinumab. The newest agent approved for use in PsA is apremilast (Otezla), a phosphodiesterase 4 (PDE-4 inhibitor) that helps to improve joint pain and swelling and is available orally.³⁹

Choosing the appropriate therapy to manage psoriasis and PsA can be challenging. Given the unpredictable clinical course of this disease, multiple trials of various agents are often necessary. To help ensure treatment adherence and desired health outcomes, proper counseling on use, expectations, and cost of therapy should be provided. Pharmacists, integral members of the healthcare

oped countries, the average rate of medication adherence is approximately 50% for chronic conditions.⁴⁰ As patient non-adherence may be intentional or unintentional, open dialogue with the patient to determine underlying concerns is of the utmost importance. The World Health Organization describes five dimensions of adherence, including patient-related factors, therapy-related factors, condition-related factors, social/economic factors, and health-system factors, with some overlap among the various factors existing (Table 4).⁴⁰

Patient-related factors of nonadherence may include patient motivation, forgetfulness, psychosocial stress, and perceptions about the disease and treatment.⁴⁰ Psychosocial stress is a common issue in patients with psoriasis, often manifesting as self-esteem issues related to the disease manifestations. Further, PsA is associated with joint destruction and reduced QoL.⁴¹ A large proportion of patients with psoriasis have comorbid depression and complaints of feelings of hopelessness and helplessness.⁴² The adjusted hazard ratios for the development of comorbid depression in this patient population are 1.28 (95% confidence interval [CI], 1.35-1.40) for patients with mild psoriasis and 1.72 (95% CI, 1.57-1.88) for those with severe psoriasis, indicating the need to assess for this condition in patients with psoriasis.⁴³

For patients who have comorbid depression, certain treatment options have been shown to be beneficial for depressive outcomes. In a phase 3 trial, etanercept was assessed compared to placebo in 618 patients with moderate to severe psoriasis and was associated with improvements in two validated questionnaires to assess depression, the Hamilton rating scale for depression (Ham-D) and the Beck Depression Index (BDI). A responder to therapy is considered to have at least a 50% improvement from baseline scores on these questionnaires. More patients demonstrated improvements in both BDI and Ham-D scores at all time points for etanercept versus placebo. At week 12, 55%

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How can you more effectively counsel patients on side effects and expectations of treatment for psoriasis and PsA to help improve patient adherence?

PsA can be treated with NSAIDs whereas moderate to severe PsA is generally treated with nonbiologic and biologic disease-modifying anti-rheumatic drugs (DMARDs). Nonbiologic DMARDs include methotrexate, leflunomide, and sulfasalazine; biologic DMARDs consist of the TNF- α inhibitors adalimumab, certolizumab, etanercept, golimumab, and infliximab and the IL inhibitors ixekizumab,

team, are well placed to provide such information.

Adherence

Adherence, defined as the degree to which the behaviors of a patient correlate with the recommendations from a healthcare professional to which the patient agrees, is a common problem in chronic disease management. In devel-

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of patients receiving etanercept were responders in the BDI compared to 39% of patients receiving placebo. Similar proportions of responders of 43% and 32%, respectively ($P=0.0048$) were demonstrated in Ham-D scores at week 12.⁴⁴ In another randomized, placebo-controlled trial, adalimumab was compared with placebo over a 12-week period. In this trial, depression was assessed with the Zung Self-Rating Depression Scale, and patients treated with adalimumab demonstrated significant improvements on this scale at week 12 versus those receiving placebo ($P < 0.001$). Improvements in depression were correlated with improvements in QoL and psoriasis disease severity.⁴⁵ These trials demonstrate the need to assess for depression in patients with psoriasis and to consider that some pharmacotherapy improves depressive symptoms in addition to improving disease severity. As depression is a risk factor for worsened patient adherence, treatment modalities that can improve depressive symptoms may improve adherence and disease status.

Much of the data pertaining to nonadherence in psoriasis pertains to the utilization of topical therapy. In one study, researchers surveyed 53 patients at an outpatient clinic to assess reasons for nonadherence to topical steroid therapy. Of the patients surveyed, 21 (40%) were nonadherent to therapy. The top reasons for underuse of topical steroids included ineffective treatment, medications staining surfaces/clothes, time-consuming application, interference with daily activities, and fear of potential side effects. Similarly, the most common reasons for overuse were more rapid clearing of disease desired, treatment not effective as prescribed, treatment more effective when used more often, and treatment more effective when greater amount applied, all of which indicate a need for better patient education. Of the 53 patients assessed, 48 patients (91%) indicated that they desired more information, particularly regarding topical treatment options and the side effects of topical therapy.⁴⁶ The time of treatment appli-

cation can vary greatly from person to person. In 1999, a survey used to assess adherence in 120 patients found that the length of time needed to apply treatments ranged from 1 minute to 3 hours and 25 minutes daily, with an average of 38 minutes per day. In addition, the researchers assessed patient preference for therapy and found that 44% of patients indi-

cal therapy only. When patients were asked in 2007 why they were receiving only topical therapy, they most commonly replied that topical therapies had fewer adverse effects than other therapies, that their disease severity did not necessitate other therapy, that their physician refused to prescribe other treatment, or that the topical therapy was effective

PAUSE AND PONDER

Which of the topical steroids do you see most frequently dispensed for the treatment of psoriasis?

cated that they would prefer systemic approaches.⁴⁷ This reinforces the need to make patients active participants in decisions regarding disease management, as patient preference, concerns about adverse effects, and time constraints of therapy may affect adherence. Lack of adherence is associated with increased healthcare costs and poor outcomes; therefore, promoting adherence is essential in the management of psoriasis.⁴⁸

In addition to patient- and treatment-related factors, disease-related factors including intrinsic severity can affect the patient's perception of the disease and willingness to seek care. One analysis of 5604 patient survey's collected biannually from the National Psoriasis Foundation (NPF) between 2003 and 2011 found that patients with severe psoriasis were more likely to seek the care of a physician compared to patients with mild disease (adjusted odds ratio [aOR] 1.55; $P=0.03$).⁴⁹ In a separate analysis of these NPF survey data, rates of untreated patients were found to range from 9.4% to 29.7% for patients with severe disease, 23.6% to 35.5% for those with moderate disease, and 36.6% to 49.2% for those with mild disease.³ This indicates a major undertreatment of the disease in the U.S.

Of the patients given therapy, 25.6% to 55.5% of patients with mild disease, 16.7% to 47% of those with moderate disease, and 10.7% to 21.5% of those with severe disease were treated with

in stopping the psoriasis. In 2007 and 2008, the reasons for discontinuing biologic therapy were also assessed, and the top reasons were found to be lack of efficacy, occurrence of adverse effects, and the cost-prohibitive nature of the medications (including lack of insurance coverage). Patient satisfaction was also assessed; 52.3% of patients with psoriasis and 45.5% of patients with PsA indicated that they were dissatisfied with their therapy, indicating the need for improvements in treatment options.³

The newer and more potent biologic agents used for the management of psoriasis and PsA have been associated with a high healthcare burden, affecting both socioeconomic and healthcare system-related factors of nonadherence. In the analysis of NPF data, it was found that patients with private insurance (aOR 3.02; $P < .001$), Medicare (aOR 2.85; $P < .001$), or Medicaid (aOR 1.96; $P = .06$) were more likely to seek care than uninsured patients. Most patients sought care from a specialist, whereas 22% of patients received care from their primary care provider. For patients who did not use specialist care, the top reasons for not seeking specialized care included giving up on therapy (27.6%), cost of therapy (21%), and annoyance with therapy (11%). This correlates with the significantly increased odds of patients with private insurance, Medicare, and Medicaid seeking care from a specialist compared to the uninsured population. Approximately

91% of patients in the study had health insurance, with an average out-of-pocket cost for psoriasis of \$2528 per year. The highest areas of spending included insurance premiums, prescription medications, physician visits, and over-the-counter medications.⁴⁹ An analysis of Humana claims data from 2010 to 2014 found that three biologic agents (etanercept, adalimumab, and ustekinumab) accounted for 86% of the total cost of psoriasis medications but accounted for only 9.6% of psoriasis medications used, further demonstrating the high cost of these newer agents.⁵⁰

High cost of therapy, coupled with patient-reported cost of therapy affecting medication utilization in previous trials^{3,46}

facturer-provided patient assistance programs for individual agents.

A strong patient-provider relationship with clearly defined expectations of disease management is important for addressing treatment-related factors. Pharmacists are primed to play an important role in the appropriate education of patients on the use of therapy for psoriasis. Key points of education may include appropriate expectations of therapy, safety, and efficacy of the therapy, and the importance of adherence for the management of the disease. Because studies have shown that patients are nonadherent to topical corticosteroids because of a fear of side effects and lack of efficacy,⁴⁶ thorough counsel-

grams, Medicare resources, and state-based assistance.⁵³

Conclusion

Psoriasis is a common dermatologic condition that is prevalent worldwide. Management of psoriasis in its many forms (including PsA) consists of disease-specific therapy and management of psychosocial complications of the disease. Disease-specific therapy depends upon a multitude of factors, including patient-specific factors, areas affected, and disease severity. Mild to moderate disease can be controlled with a number of topical agents, most commonly topical steroids; however, these agents are associated with low adherence rates. For more severe disease, systemic therapy with methotrexate, apremilast, or biologic agents in conjunction with phototherapy is often employed. Patients and providers must remember that psoriasis does not have a cure, and management will only limit the effects of the disease.

Access to care and adherence to therapy remain large problems for patients with psoriasis. One reason for this lack of adherence is the cost-prohibitive nature of the newer agents available. In 2008, psoriasis was associated with \$11 billion in healthcare costs, a large portion of which falls on the patient; approximately 55% of total costs are out-of-pocket expenses.^{55,56} Patients with psoriasis also have high rates of dissatisfaction with therapy, with many patients underusing topical medications because of lack of efficacy.⁴⁷ This can cause worsening of the disease, which can worsen patient satisfaction, thus leading to a cycle of nonadherence. Time restraints, fear of side effects, and comorbid depression can also compound adherence issues.^{57,58} Pharmacists are in an ideal position to work with patients in an attempt to identify improper treatment and promote adherence to therapy. •

» **References** are available online at www.drugtopics.com/cpe.

“Lack of adherence is associated with increased healthcare costs and poor outcomes; therefore, promoting adherence is essential in the management of psoriasis.

indicate that healthcare cost and insurance status may be a barrier to accessing care. A new bipartisan bill, the Patients' Access to Treatments Act (PATA), supported by the NPF and other organizations, seeks to address the high out-of-pocket costs associated with prescription drugs.⁵¹ This bill, which was introduced to the House of Representatives in March 2015, seeks to amend the Public Health Service Act to limit the copayments, tier system, and out-of-pocket costs associated with specialty medications such as biologic therapy. Should such a bill pass, it would ease access to care, thereby decreasing the number of patients lacking therapy or using suboptimal medications for their disease severity.⁵² Additionally, the advent and approval of biosimilars, including the infliximab biosimilar that was approved by the FDA in April 2016 may allow for better access to care for all patients. Other resources to improve access to care include manu-

ing on what to expect in terms of symptom improvement and adverse effects is essential.

The NPF produces a variety of patient educational materials that can be given to the patient for further education. Patients with PsA may be directed to the Arthritis Foundation (www.arthritis.org) for more information.⁵³ Regular follow-up and assessment of patient understanding of the treatment course is important to promote continued appropriate use of therapy. Studies have demonstrated that adherence to therapy is reduced over time, so regular reinforcement of this information is important.⁵⁴ Pharmacists can also assist by improving the availability of medications. Studies have found that many patients do not take their medications because of prohibitive cost or lack of insurance coverage. The NPF website has a number of resources to help patients access care, including links to patient assistance pro-

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FOR PATIENTS WITH PSORIASIS AND PSORIATIC ARTHRITIS

TEST QUESTIONS

FOR PHARMACISTS

1. Which of the following best describes prescribing patterns in psoriasis?

- a. Most patients with psoriasis have mild to moderate psoriasis that is managed appropriately with biologic therapy, although many patients are untreated.
- b. A larger number of patients with severe psoriasis are not managed with any agent versus those with mild disease.
- c. Most patients with psoriasis have severe psoriasis, and a large percentage of these cases are treated with topical therapy only.
- d. Most patients have mild to moderate psoriasis that is managed with topical therapy, but many patients are untreated.

2. KG is a 28-year-old man with newly diagnosed mild psoriasis who comes to your pharmacy. He is taking fluticasone propionate 0.05% cream (15 g) to be applied twice daily for the psoriatic lesions on his legs. He first filled his prescription in January and comes in for his refill in May complaining of worsened psoriatic lesions. When performing last-day recall, the patient states that he applies his topical therapy only once daily most days of the week, as he rushes around so much in the morning that he forgets to use the medication. What WHO type of nonadherence is this patient presenting with?

- a. Socioeconomic
- b. Patient
- c. Health system
- d. Condition

Questions 3 through 6 relate to patient DC.

3. DC is a 67-year-old woman with a medical history of psoriasis diagnosed in 1990 (affecting 7% of her BSA), ring worm, and skin cancer. She has tried various corticosteroid therapies over the years, and previously used UVB therapy. She is a retired high school guidance counselor who lives at home with her husband. She has three adult children, and has recently started babysitting her two-month-old granddaughter. She presents to your pharmacy today to pick up her clobetasol ointment that she fills reliably each

month as her only medication for psoriasis. Her 50th high school reunion is coming up, and she is worried about how disfigured her legs appear. When talking to the patient, you find that she perseverates on how horrible her legs are, and how useless her therapy is. She states that she is contemplating skipping her reunion entirely due to her anxiety around her condition and worsening clinical depression. Which of the following describes appropriate options for DC at this time?

- a. Maintain current therapy and remind DC that there is no cure for psoriasis.
- b. Consideration should be given to the use of infliximab, as the patient is showing psychosocial complications of psoriasis.
- c. Consideration should be given to using etanercept, as this agent has been shown to improve depressive symptoms in addition to psoriatic symptoms.
- d. Consideration should be given to increasing the intensity of corticosteroid therapy to improve her results thereby improving her self-esteem.

4. DC's current medication list consists of a daily multivitamin, and clobetasol propionate 0.05% ointment applied twice daily to affected areas, which she has been using for the past six months. DC states that her psoriasis used to be better, and that she is concerned about what she can do. Which of the following would be the best option for DC at this time?

- a. As DC has mild to moderate psoriasis, topical therapy is preferred.
- b. As DC has mild to moderate psoriasis, systemic therapy is preferred and DC and her healthcare team should consider the addition of a systemic biologic agent.
- c. As DC has severe psoriasis, combination therapy is preferred, so DC and her healthcare team should consider utilizing phototherapy in addition to her clobetasol as it has been shown to be more effective.

d. As DC has severe psoriasis, combination therapy is preferred, and DC and her healthcare team should consider the addition of a systemic biologic agent.

5. What counseling points should be provided to DC at this time?

- a. Information about the adverse effects associated with long-term use of corticosteroids
- b. The importance of adherence
- c. Reinforcement of expectations regarding psoriasis care
- d. All of the above

6. DC states that she is concerned about the cost of her medications. Which of the following may be options to help DC with the economic burden at this time?

- a. Thanks to Patients' Access to Treatments Act, DC's therapy will be covered by her insurance without issue.
- b. Change DC's medication to ustekinumab, as this will manage her disease severity and decrease the number of agents she needs, increasing cost-effectiveness.
- c. Use the NPF resources available to determine whether any patient assistance programs are available for DC's therapy.
- d. Refer DC to her rheumatologist, who is better able to assist her.

7. TR is a 33-year-old woman with new-onset mild psoriasis that is managed with mometasone furoate 0.1% cream (class 2 potency). Based on the prescription directions for use, her cream prescription should be filled monthly. She received her first fill of the ointment two months ago and comes to the pharmacy complaining that she has not seen an improvement in her symptoms. Which of the following is the best option at this time?

- a. Contact the physician about changing TR's prescription to a class 1 superpotent agent as these drugs

are more effective and TR is not optimally managed.

- b. Contact the physician about adding apremilast therapy to TR's regimen, as the patient's symptoms are not well controlled with her current treatment.
- c. Assess TR's adherence and reinforce the need to take the medication as directed to see the benefits.
- d. Reinforce realistic expectations regarding therapy with TR, focusing on the fact that topical therapy does not cure psoriasis and takes time to work.

8. NC is a 37-year-old woman with mild psoriasis diagnosed in 2010 that has spread to her hands and feet. She has been using topical steroids intermittently over the years and initiated treatment with fluocinonide 0.1% cream three months ago, with some improvements in plaque appearance. Which of the following actions should be considered now?

- a. Addition of systemic therapy, as the patient now has severe psoriasis now
- b. Addition of systemic therapy, as the patient now has moderate psoriasis now
- c. Addition of coal tar, as the patient now has moderate psoriasis now
- d. Maintenance of current therapy, as the patient has not had a sufficient treatment period

9. Which of the following is a side effect of long-term topical corticosteroid use?

- a. Build-up of skin
- b. Skin atrophy
- c. Hyperpigmentation
- d. Increased activity

10. Which of the following best matches the agent to the potential adverse effect?

- a. Tazarotene: teratogenicity
- b. Etanercept: perilesional irritation
- c. Tazarotene: headache
- d. Calcipotriene: skin atrophy

FOR PHARMACY TECHNICIANS

1. Both plaque psoriasis and PsA commonly affects which of the following body areas?

- a. Fingers
- b. Upper back

- c. Knees
- d. Elbows

2. Which of the following may precede the onset of the development of psoriatic lesions?

- a. Strep throat
- b. Conjunctivitis
- c. Allergic rhinitis
- d. Blepharitis

3. All of the following are sign/symptoms of PsA except:

- a. Swelling
- b. Pain
- c. Stiffness
- d. Pruritus

4. Which of the following resources provides patient-friendly information about psoriasis?

- a. American Academy of Dermatol-

ogy Guidelines on Management of Psoriasis and PsA

b. National Psoriasis Foundation

c. Canadian Guidelines for the Management of Plaque Psoriasis

d. Group for Research and Assessment of Psoriasis and Psoriatic Arthritis

5. Which of the following resources provide patient-friendly information about PsA?

a. Arthritis Foundation

b. American Academy of Rheumatology

c. Group for Research and Assessment of Psoriasis and Psoriatic Arthritis

d. American Academy of Dermatology Guidelines on Management of Psoriasis and PsA

6. Which of the following topical therapies is not FDA approved for use in the management of psoriasis?

- a. Desonide
- b. Tacrolimus
- c. Calcipotriene
- d. Tazarotene

7. Which of the following medications used in the treatment of psoriasis is correctly paired with its side effect?

- a. Clobetasol: tachyphylaxis
- b. Calcipotriene: teratogenicity
- c. Tacrolimus: striae
- d. Tazarotene: skin atrophy

8. Which of the following biologics is associated with an increased risk of inflammatory bowel disease and therefore requires monitoring?

- a. Golimumab
- b. Certolizumab
- c. Secukinumab
- d. Ustekinumab

9. All of the following are approved for use in the management of PsA except:

- a. Ixekizumab
- b. Certolizumab
- c. Adalimumab
- d. Golimumab

10. Referral to the pharmacist would be warranted in which of the following situations?

- a. Co-pay inquiry
- b. Counseling on side effects
- c. Concerns about patient adherence
- d. All of the above

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