

MANAGED CARE INTERFACE®

www.MedicomInt.com

January 2006 • Volume 19 • Number 1



*The Official Publication
of The Pharmacy &
Therapeutics Society*

INSIDE

ORIGINAL RESEARCH

**Screening and Treatment of
Hypercholesterolemia for Prevention
of Coronary Heart Disease**

HEALTH ECONOMICS

**Home Ultraviolet B Phototherapy:
A Cost-Effective Option for Severe Psoriasis**

PHARMACY PRACTICE

**Evolution of Managed Care Pharmacy
and Therapeutics Committees**

**The Evolutionary Role of the
Pharmacy and Therapeutics Committee
in Technology Assessment**

DISEASE MANAGEMENT

**Hurricanes May Help the Move
Toward Portable Medical Data**

MEETING POINT

Academy of Managed Care Pharmacy



*The Peer-Reviewed Journal Read by
Decision Makers in Managed Care*



HOME ULTRAVIOLET B PHOTOTHERAPY: A COST-EFFECTIVE OPTION FOR SEVERE PSORIASIS

*Christopher B. Yelverton, MD, MBA, Amit S. Kulkarni, MS,
Rajesh Balkrishnan, PhD, Steven R. Feldman, MD, PhD*

The cost of treating severe psoriasis has risen dramatically, and treatment options vary widely in terms of cost and efficacy. However, little information is available on the relative costs of home phototherapy and other long-term management options, specifically in the context of managed care. A payer-perspective cost model was developed to estimate and compare the direct expenditures associated with a 30-year course of various treatments for severe psoriasis. Within two years of treatment initiation, home-administered ultraviolet B phototherapy was less costly than any of the other treatments examined, including methotrexate, psoralen plus ultraviolet A, the retinoid acitretin, and new biologic agents. In addition, the efficacy and safety profile of home ultraviolet B phototherapy make it an excellent choice for extended management.

Psoriasis is a lifelong, often debilitating skin disease that affects more than 5 million people in the United States. Ten percent to 30% of patients with psoriasis have a severe case that covers more than 10% of the total body surface and/or causes significant morbidity.¹ Unlike mild cases, which can often be managed with topical therapies, severe psoriasis almost always requires aggressive management. Standard options for severe psoriasis include phototherapy and systemic treatment.

Phototherapy consists of either ultraviolet B (UVB) exposure or the combination of an oral psoralen (methoxsalen) with ultraviolet A (PUVA) exposure. Although PUVA is one of the most effective psoriasis treatments available, with a success rate of 80% or higher, it is generally reserved for resistant disease because of its acute side effects and link to skin cancer in patients with light skin pigmentation.^{2,3} Unlike PUVA, UVB

phototherapy has a much lower carcinogenic potential.^{2,4,5} Also, UVB can be administered in the inpatient, outpatient, or home setting. The reported efficacy of UVB varies widely in published studies, from 60% for broad-band UVB to nearly 80% for narrow-band UVB.^{3,5,6}

Use of new biologic therapies for psoriasis has increased. These agents block immunologic processes that lead to the symptoms of psoriasis. Although biologics are a major advance in the treatment of severe psoriasis, they are costly and their long-term safety profiles are poorly defined. In contrast, the safety and effectiveness of UVB phototherapy are well established. However, for many patients, office-based phototherapy is inconvenient, cost prohibitive (owing to burdensome copays), or unavailable, which can lead to reliance on expensive biologics. Home-administered UVB phototherapy is a convenient, less costly alternative for patients with extensive skin involvement.

This study was conducted to estimate and compare the cost of lifelong treatment with home phototherapy with the costs of other treatments for severe psoriasis.

METHODS

A model was developed to calculate and compare, from the perspective of

Dr. Yelverton is a Research Fellow in the Department of Dermatology, Wake Forest University School of Medicine, Winston-Salem, North Carolina. Mr. Kulkarni is a Research Assistant in the College of Pharmacy and Dr. Balkrishnan is a Professor in the College of Pharmacy and School of Public Health, Ohio State University, Columbus, Ohio. Dr. Feldman is a Professor in the Departments of Dermatology, Pathology, and Public Health Sciences, Wake Forest University School of Medicine.

a third-party payer, the direct cost of home phototherapy and common systemic treatments for extensive psoriasis. A 30-year treatment period was employed, in which all future expenses were discounted to present value at an annual rate of 5%, according to standard time-value of money calculations.

Direct costs of treatment with home UVB phototherapy include equipment acquisition, required bulb replacement, and costs of follow-up office visits. The equipment used for the analysis was a six-foot, narrow-band UVB apparatus with six lamps (Panazol II, National Biological Corp., Twinsburg, OH). Estimates of the frequency and duration of home UVB treatments were based on the manufacturer's recommendations, a previously published survey of home users, and clinical experience.⁷ Narrow-band UV bulbs are rated to have an operational life of approximately 600 hours; with use of the device three times weekly at an average of six minutes per treatment, these bulbs could be expected to last for the entire 30-year study period. However, a much more conservative measure of bulb replacement every five years was used. Home phototherapy users should be seen for follow-up every three months, and allowable Medicare reimbursement for a level 3 office visit in North Carolina was used to estimate this cost.⁸

Similar models were implemented in order to calculate the costs of other common treatments for psoriasis. The therapies examined included PUVA,

methotrexate, acitretin, and the three approved biologics alefacept, etanercept, and efalizumab. The accuracy of the cost models used was verified by previously published cost studies of psoriasis.⁹ Single-point estimates for the costs of follow-up visits, laboratory studies, and clinical procedures were derived from allowable Medicare expenses for North Carolina. The frequencies of interventions were based on labeled indications for the chosen treatments. For drugs with variable initial dosing (e.g., the recommended etanercept dosing is 50 mg twice weekly for the first 3 months, then maintenance at 50 mg weekly), the maintenance dose was used for the entire period. Drug cost was estimated from the average wholesale price for 2002. For dosage based on patients' weight, 75 kg was used (Table I).

In contrast with the other treatment regimens, home phototherapy costs are greatest at initiation, owing to equipment acquisition. Therefore, a break-even analysis for home phototherapy was performed, comparing the treatment with methotrexate, PUVA therapy, and etanercept (as a representative biologic) to determine the length of time before phototherapy becomes less costly than the other treatments. For this analysis, standard dosing of etanercept (50 mg twice weekly for 3 months, then 50 mg weekly) was used. Time value of monetary calculations was also used for this analysis, and was based on a 5% annual discount.

RESULTS

The present value of a 30-year treatment course with home UVB phototherapy was calculated to be \$7,085.27. This figure comprises the direct costs of the phototherapy unit, periodic bulb replacement, and office visits (Figure 1).

The direct cost of methotrexate therapy over 30 years was \$19,102. The cost of PUVA was \$37,591, and acitretin monotherapy was \$75,113. The costs of 30 years of biological therapy were \$171,915.22 for efalizumab, \$257,683.89 for etanercept, and \$319,356.19 for alefacept. Details of the cost model are shown in Table II.

The break-even analysis showed that home phototherapy costs were exceeded by all other treatments within a two-year period (Figure 2). Etanercept therapy was more costly than home phototherapy in the first month. By 11 months, PUVA therapy became more costly than home UVB. Costs for methotrexate became more costly than home phototherapy within 23 months.

DISCUSSION

Treatments for severe psoriasis vary widely in efficacy, convenience, and cost. The complexity of choosing appropriate therapy can challenge physicians and patients alike. Several attempts to clarify the cost and cost effectiveness of various treatment modalities have been undertaken.^{9,10} However, no standard of care exists for the treatment of psoriasis.

TABLE I: TREATMENT FOR SEVERE PSORIASIS

| Treatment* | Administration | Dosage | Treatment Frequency | Labs | Other Interventions | Follow-up (/yr) |
|--------------|----------------|--------|---------------------|----------------------------------|--------------------------|-----------------|
| Home UVB | N/A | 6 min | Every other day | None | | 4 |
| PUVA | Oral | 40 mg | 30/yr | None | | 4 |
| Methotrexate | Oral (tablet) | 15 mg | Weekly | CBC and LFTs 8 times/yr | Biennial liver biopsy | 8 |
| Acitretin | Oral | 25 mg | Daily | Lipids and LFTs 4 times/yr | | 6 |
| Alefacept | IM (in office) | 15 mg | 18/yr | CD4 count with each injection | | 6 |
| Efalizumab | Subcutaneous | 75 mg | Weekly | CBC 6 times/yr | | 6 |
| Etanercept | Subcutaneous | 50 mg | Weekly | PPD at initiation | | 4 |

*Assumptions based on Feldman SR, Clark A, Reboussin DM, et al: An assessment of potential problems of home phototherapy treatment of psoriasis. *Cutis* 1996;58(1):71-73. Maintenance doses were used for all chronic medications. N/A = Not applicable; CBC = complete blood count; LFT = liver function test; IM = intramuscular; PPD = purified protein derivative test.

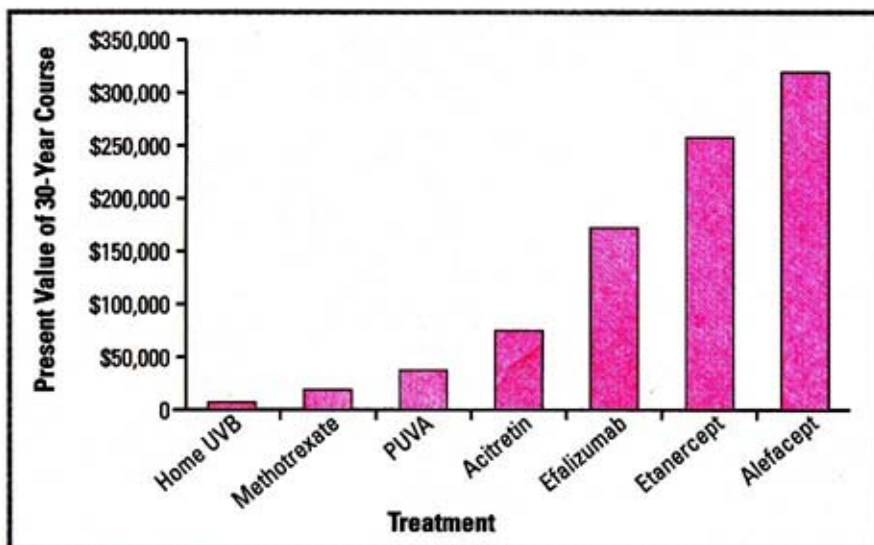


Figure 1. Cost of 30 years of monotherapy for severe psoriasis, based on current values. Amounts consider equipment acquisition and maintenance, medication, laboratory and other procedures, and necessary follow-up. UVB = Ultraviolet B; PUVA = oral psoralen/ultraviolet A.

A major limitation of most cost studies of psoriasis is their short time frame (≤ 1 yr). Given the prolonged natural course of psoriasis, it is prudent to estimate the costs of various therapies over a longer period, which more accurately demonstrates the true cost and potential cost savings of a given treatment from the perspectives of the patient, payer, and society. In addition, costs for the management of long-term complications can be estimated.

Treatment of psoriasis represents a significant burden to the health care industry. Estimates in the United States suggest that the total cost for psoriasis care approaches \$3 billion. The fact that psoriasis entails substantial morbidity makes the development of

effective therapies important to both patients and physicians. The newer biologic therapies are very effective for the treatment of extensive psoriasis, but at a substantial cost. Development and marketing of these agents will likely keep treatment expenses high for the foreseeable future.

Status of UVB Phototherapy. With a reported success rate approaching 80%,^{5,6,11} UVB therapy is among the most effective treatments for severe psoriasis. In addition, it has a highly favorable side-effect profile. Unfortunately, utilization of outpatient UVB therapy, where it is available, is commonly limited by high costs and inconvenience; initial outpatient

sessions are three to five times weekly, followed by weekly maintenance visits, and access to a treatment facility is difficult for some patients. To a large degree, office-based UVB treatment has fallen out of favor in the United States, and inpatient (Goekerman treatment), or day-hospital, therapies are nearly nonexistent in this country.¹² A recent National Psoriasis Foundation (Portland, OR) survey indicated that only about one-third of patients with moderate-to-severe psoriasis have ever tried phototherapy.¹ Perhaps this is largely attributable to disincentives that insurers place on office-based UVB therapy, including copays required of patients and poor reimbursement to physicians who must maintain equipment and staff for phototherapy.

Office-based treatment confers certain advantages, such as determination of responsiveness to treatment, assessment of compliance, monitoring of dosing and response, and identification of adverse effects. Therefore, office therapy should not be replaced by home treatment. However, home UVB phototherapy is less costly and more convenient than office-based treatment and is an excellent choice for patients for whom office treatment is inaccessible or unreasonably inconvenient. Also it is a good alternative for maintenance treatment in patients who have responded to office UVB treatment but who would benefit from its lower cost and greater convenience during long-term maintenance treatment.

This analysis revealed that home phototherapy is the least costly option for long-term treatment of psoriasis.

TABLE II: COST OF TREATING SEVERE PSORIASIS

| Treatment | Annual Drug Cost | Annual Cost of Tx, Admin, and Other | Annual Laboratory Cost | Annual Cost of Follow-up | Cost of 30-Year Course* |
|--------------|------------------|-------------------------------------|------------------------|--------------------------|-------------------------|
| Home UVB | 0 | \$2,150.00 | 0 | \$195.04 | \$7,085.27 |
| Methotrexate | \$397.80 | \$411.85 | \$240.88 | \$390.08 | \$19,102.36 |
| PUVA | \$816.00 | \$1,409.70 | 0 | \$195.04 | \$37,591.46 |
| Acitretin | \$4,471.25 | 0 | \$136.60 | \$292.56 | \$75,112.69 |
| Efalizumab | \$10,701.60 | 0 | \$73.32 | \$292.56 | \$171,915.22 |
| Etanercept | \$16,198.00 | 0 | \$8.52 | \$390.08 | \$257,683.89 |
| Adalimumab | \$17,818.32 | 0 | \$8.52 | \$292.56 | \$281,281.69 |
| Alefacept | \$17,910.00 | \$406.77 | \$1,596.78 | \$292.56 | \$319,356.19 |

Tx = Treatment; Admin = administrative; UVB = ultraviolet B; PUVA = oral psoralen plus ultraviolet A.
*The current value of a 30-year treatment course of monotherapy with each modality is shown.

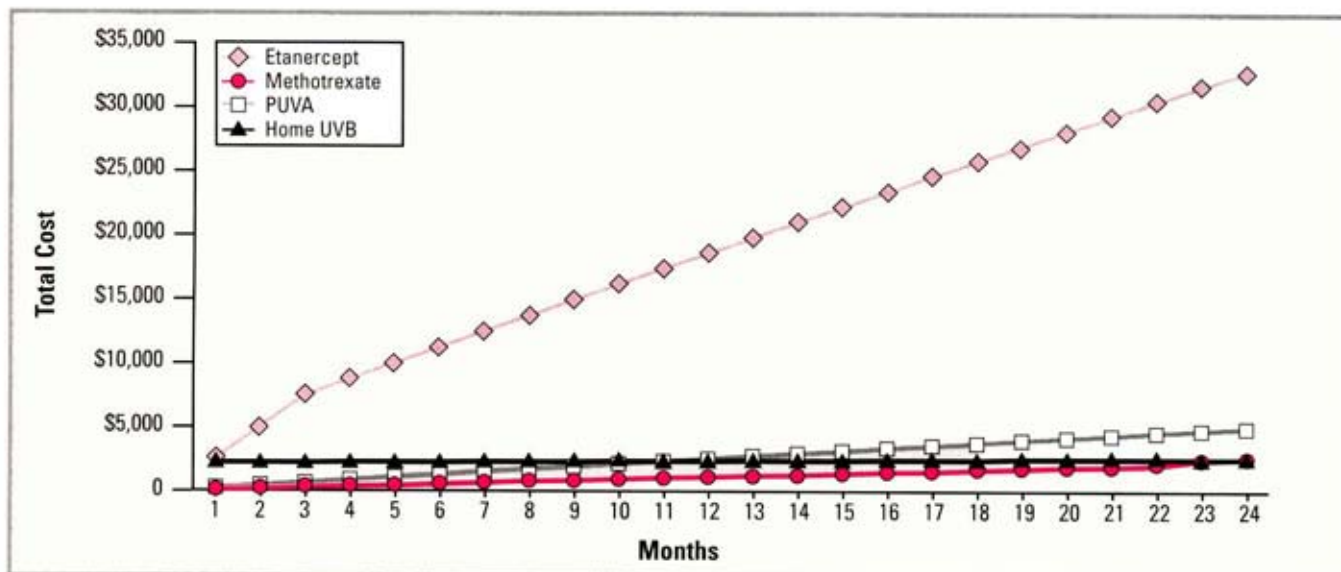


Figure 2. Break-even analysis for home ultraviolet B (UVB) phototherapy. The current value of relative treatment costs over a two-year period are shown. PUVA = Psoralen ultraviolet A.

Moreover, the break-even analysis indicated that even over relatively short periods of time (< 2 yr), home phototherapy is less costly than PUVA or systemic therapy with methotrexate or biologics.

Unfortunately many insurers have made home UVB almost as difficult to utilize as outpatient treatment. Under most plans, home light units are categorized as durable medical equipment (DME), rather than as pharmacology. Although health plans vary widely in their coverage policies for DME, most cover only a portion of the cost, and the approval process can be complex. This can leave patients frustrated by the confusing paperwork and substantial co-pays required to obtain a light unit.

Study Limitations. Psoriasis is a complicated and symptomatically variable disease. Several large population studies have revealed that the natural course of psoriasis differs considerably among individuals. Similarly, the efficacy of the many treatment options is highly individualized. Accordingly, this study made few assumptions about the efficacy of any given treatment. For the sake of simplicity, combination therapies, which are commonly prescribed for severe psoriasis, were not considered.

No reliable information is available on the efficacy of patient-administered UVB therapy. Manufacturers have made

great strides in recent years by incorporating timers into their units, thereby requiring physician renewal for continued treatment, but physician monitoring of home UVB use remains imprecise. However, despite the limitations of the model, the dramatically lower cost of home UVB phototherapy compared other with options is not likely a result of any of the model's assumptions.

Another limitation is that some patients are inappropriate candidates for home UVB phototherapy. Certain persons have contraindications to phototherapy, such as those who have had skin cancer, patients whose ability to comply with safe use is questionable, and patients with severe psoriatic arthritis that requires systemic treatment. Not all patients will respond to phototherapy, and efficacy may diminish with time. However, when appropriate, the cost of home-administered UVB therapy is considerably lower than that of only a few months of treatment with a biologic agent.

Biologic therapies are much more expensive than more established treatments, and their role has not been clearly defined in psoriasis management. Experience in the field of rheumatology suggests that these treatments are highly effective against psoriasis and psoriatic arthritis, and their safety profiles are better than those of other systemic

agents. However, it is unknown how these therapies would behave over a 30-year treatment course, as proposed in this study. It is conceivable that these agents can confer extended remissions, or perhaps even "cure" psoriasis in some patients. On the other hand, their efficacy may diminish over time. Therefore, appropriate dosing schedules have not been determined.

CONCLUSION

Ultraviolet phototherapy is an effective and relatively inexpensive option for many patients with psoriasis. Managed care plans could better manage psoriasis by reducing disincentives to phototherapy. Indeed, payers should encourage physicians to make greater use of home phototherapy. Compared with other options, home UVB treatment can potentially provide insurers significant savings.

DISCLOSURE

Dr. Yelverton, Mr. Kulkarni, Dr. Balkrishnan, and Dr. Feldman have indicated they have no relevant relationships with commercial or equipment companies to disclose.

REFERENCES

1. About Psoriasis: Statistics. The National Psoriasis Foundation (www.psoriasis.org/about/stats/), 2005.
2. Stern RS, Laird N: The carcinogenic risk of treatments for severe psoriasis. Phototherapy Follow-up Study. *Cancer* 1994;73:2759-2764.

Continued on page 39

3. Griffiths CE, Clark CM, Chalmers RJ, et al: A systematic review of treatments for severe psoriasis. *Health Technol Assess* 2000;4(40):1-125.

4. Larko O: Phototherapy of psoriasis—clinical aspects and risk evaluation. *Acta Derm Venereol* 1982;103(suppl Stockh):1-42.

5. van Weelden H, De La Faille HB, Young E, et al: A new development in UVB phototherapy of psoriasis. *Br J Dermatol* 1988;119:11-19.

6. Walters IB, Burack LH, Coven TR, et al: Suberythemogenic narrow-band UVB is markedly more effective than conventional UVB in treatment of psoriasis vulgaris. *J Am Acad Dermatol* 1999;40:893-900.

7. Feldman SR, Clark A, Reboussin DM, et al: An assessment of potential problems of

home phototherapy treatment of psoriasis. *Cutis* 1996;58:71-73.

8. Ellis CN, Reiter KL, Wheeler JR, et al: Economic analysis in dermatology. *J Am Acad Dermatol* 2002;46:271-283.

9. Feldman SR, Garton R, Averett W, et al: Strategy to manage the treatment of severe psoriasis: Considerations of efficacy, safety and cost. *Expert Opin Pharmacother* 2003;4:1525-1533.

10. Jenner N, Campbell J, Plunkett A, et al: Cost of psoriasis: A study on the morbidity and financial effects of having psoriasis in Australia. *Australas J Dermatol* 2002;43:255-261.

11. Karrer S, Eholzer C, Ackermann G, et al: Phototherapy of psoriasis: Comparative experience of different phototherapeutic

approaches. *Dermatology* 2001;202:108-115.

12. Housman TS, Rohrback JM, Fleischer Jr AB, et al: Phototherapy utilization for psoriasis is declining in the United States. *J Am Acad Dermatol* 2002;46:557-559.

Address for correspondence: Steven R. Feldman, MD, PhD, Wake Forest University School of Medicine, Department of Dermatology, Medical Center Boulevard, Winston-Salem, North Carolina 27157-1071. E-mail: sfeldman@wfubmc.edu.

To obtain reprints, please contact Kevin Chamberlain at (914) 337-7878, ext. 202 or visit our website at www.medicomint.com. Copyright 2006 by Medicom International. All rights reserved.