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Commentary

Explicit and implicit copayments for phototherapy: examining the cost of commuting

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Abstract

Background: Whereas phototherapy is a safe and cost-effective treatment modality for psoriasis, economic disincentives discourage its use, including both direct and indirect costs to the patient.

Purpose: To determine when it may be cost-effective for patients to purchase a home light unit versus driving to clinic for outpatient phototherapy sessions.

Methods: Estimates of expenses associated with 3 months of outpatient phototherapy were determined and compared to the price of a home phototherapy unit. Factors examined included the cost of gasoline (based on the national average), fuel efficiency of the vehicle, cost of owning and operating a motor vehicle, lost wages, and copayments.

Results: The cost for a standard 6-bulb narrowband UVB home unit is approximately \$2600. Direct and indirect expenses imposed on patients increase with distance travelled to the dermatologist. If a patient lives 20 or more miles away from the dermatologist, the expenses associated with travel can total more than the out of pocket expense of purchasing a home phototherapy unit.

Limitations: This small analysis only accounted for the first 3 months of treatment and likely underestimates the total costs that patients would experience over a lifetime of treatment.

Conclusions: It may be beneficial for physicians to educate patients on the cost-burden of in-office versus home phototherapy because patients can use these parameters to determine which option would be more cost-effective for them.

Keywords: phototherapy, economics, cost-effective, commuting, dermatology

Introduction

Phototherapy is a safe and effective form of treatment for many skin diseases and can be administered both in the office and at home [1,2]. Despite its track record of safety and efficacy, there has been a decline in the prescription of phototherapy. A leading reason for this decline is that patients often find it difficult to attend outpatient phototherapy sessions 3 days per week, which can

result in loss of work time and consequently lost wages. Additionally, some insurance policies require copayments by patients for each office-based phototherapy session. These copayments can add up quickly during a course of treatment.

A potential alternative to office-based phototherapy is the prescription of home-based phototherapy. Home-based phototherapy can be as effective as office-based treatment [3]. A prescription-controlled home UV device can alleviate the inconvenience of travel while maintaining some level of physician oversight over phototherapy use. Unfortunately, the perceived up-front cost of a home phototherapy device is often more than patients are willing or able to spend.

One of the factors that would determine the relative cost effectiveness of home vs. office-based phototherapy is the time and expense required for travel for treatment. Whereas inconvenience of travel has been discussed in relation to office-based phototherapy, the economics of traveling to and from a physician's office 3 times per week have not been well characterized. We attempted to answer the question, "How far away from the dermatologist does a patient need to live before the expense of travel outweighs the cost of a home phototherapy unit?"

Methods

We estimated the cost to the patient for 3 months of outpatient phototherapy in terms of travel costs and the costs related to time lost from work. Factors examined included the cost of gas (based on the national average), fuel efficiency of the vehicle, cost of owning and operating a vehicle, and lost wages. Lost wages were calculated as a function of time traveled plus an additional 15 minutes for time spent in the office. Average travel times for a given distance were obtained from the Bureau of Transportation Statistics [4]. The national average hourly wage was obtained from the Bureau of Labor Statistics [5]. Operation costs as a function of distance traveled were obtained from the Bureau of Transportation Statistics' 2010 Cost of Owning and Operating a Vehicle [6]. Operation costs include ownership costs (insurance, license, registration, taxes, depreciation, and finance charges) as well as maintenance (tires, oil changes, etc.). A sensitivity analysis was performed to examine the range of cost between a spectrum of gas prices and fuel efficiency [7,8].

Example of calculation: $((\text{Miles} / \text{MPG}) * (\$3.50/\text{Gallon})) + (\text{Miles} * \text{Operational cost})) * (2 \text{ for round trip}) + \text{Lost wages for given distance} = \text{Cost per visit.}$

Cost per visit was multiplied by 36 visits for a 12-week period to yield the total cost for 3 months of outpatient phototherapy. The estimated expenses (e.g., fuel, owning and maintaining a motor vehicle, lost wages) associated with traveling 10, 20, 30, 40, and 50 miles for in-office phototherapy were determined. These estimated expenses were based on having a motor vehicle with a mileage rate of 25 miles per gallon (MPG).

We reviewed the prices of commercially available home phototherapy devices. By way of comparison to the expense to office-based phototherapy, we used the cost of a 6 bulb, single panel, narrowband UVB light unit (Panosol II, Amjo Corp, West Chester, OH) [9].

Results

At the time of this analysis, the national average for gasoline was approximately \$3.50. The national mean hourly wage for 2010 was \$21.35. The average operational cost of a vehicle was \$0.50 per mile. Average one-way travel times ranged from 19.5 minutes for a 10-mile trip to 122 minutes for a 100-mile trip. The cost to the patient for commuting to the dermatologist 3 times per week for 12 weeks ranges from \$461 for 10 miles and \$2304 for 50 miles (Table 1). After lost wages were included, the minimum expense to patients traveling 10 miles for 3 months of in-office phototherapy was \$1,871 with and \$1,151 without copayments.

Miles traveled each way	10	20	30	40	50
Gallons of gas (25 MPG) ⁷	0.4	0.8	1.2	1.6	2
Cost of Gas (\$3.5/gallon) ⁸	\$1	\$3	\$4	\$6	\$7
Depreciation (\$0.5/mile) ⁶	\$5	\$10	\$15	\$20	\$25
Car cost per trip	\$6	\$13	\$19	\$26	\$32
x 2 for Round Trip	\$13	\$26	\$38	\$51	\$64
Subtotal per visit	\$13	\$26	\$38	\$51	\$64
3 round visits per week	\$38	\$77	\$115	\$154	\$192
Initial 12-Week Therapy	\$461	\$922	\$1,382	\$1,843	\$2,304
Average trip time (hours) ⁴	0.90	1.27	1.66	1.93	2.39
Average lost wages per trip ⁵	\$19	\$27	\$35	\$41	\$51
Initial therapy + lost wages	\$1,151	\$1,900	\$2,655	\$3,330	\$4,144
Initial Therapy, lost wages + copay	\$1,871	\$2,620	\$3,375	\$4,050	\$4,864

Table 1. Patients' cost for office-based phototherapy sensitivity analysis

*Assuming average 25MPG, mean hourly wage at \$21.35, and \$20 copayment per visit.

Fuel economy of patients' mode of transportation impacts the cost of commuting (Figure 1). Compared to a vehicle with a fuel efficiency of 25 MPG, a patient driving a vehicle that achieves only 15 MPG can expect to pay \$67 to \$336 more in out-of-pocket expense (Table 2).

Fuel Efficiency \ Miles	10	20	30	40	50
Δ 20 to 25 MPG	\$25	\$50	\$76	\$101	\$126
Δ 15 to 20 MPG	\$42	\$84	\$126	\$168	\$210
Δ 15 to 25 MPG	\$67	\$134	\$202	\$269	\$336

Table 2. Differences in cost based on fuel efficiency

Home narrowband UVB phototherapy units range from \$690 for a handheld wand to \$6990 for a 16-lamp unit. The cost for a standard 6 bulb, flat panel home unit (Panasol II) is approximately \$2600 [9]. The out-of-pocket expense endured by the patient may be less, depending on insurance coverage. When factors such as lost wages, copayments, cost of fuel, and car maintenance are included, a patient can expect to pay \$2,600 or more when traveling 20 miles each way.

Discussion

Covering the cost of home phototherapy is highly cost effective for insurers [10,11]. Unfortunately, many insurers do not cover the full amount of purchasing a home unit. It is often unclear to the patient and the physician exactly how much a particular insurance plan will reimburse if the patient were to purchase a unit. Risking the large up front payment for a home unit may be daunting to the patient and may be more than the patient is willing or able to afford without assistance. The slower trickle of costs of multiple copayments for office-based treatment may then appear more affordable.

Although not every office or insurance requires copayments with each session of phototherapy in the office, there are "built-in" copayments for office-based phototherapy via direct and indirect costs of travel. These built-in costs eventually add up to more than the cost of a home unit – even without financial assistance from the insurer. When lost wages are taken into consideration, it may be cost-effective for patients to purchase a home unit if they are traveling greater than 30 miles each way for the clinic visits. Furthermore, if both lost wages and treatment-related copayments are taken into account, this distance decreases to 20 miles each way.

Insurers often help cover at least part of the cost of a home phototherapy unit, effectively decreasing the cost-effective breakpoint. Although patients who live 30 miles or more from the dermatologist would clearly benefit financially from home phototherapy, it may also be more cost-effective to invest in home phototherapy even when patients live only 10 miles away. That is, if one assumes at least partial coverage of the home unit by insurance company, the total out of pocket expense may end up being \$1500 or less, approaching the cost of only 3 months of in-office phototherapy. Quite often, patients need more than just 3 months of phototherapy, because diseases like psoriasis are life-long. Additional commuting to and from the dermatologist throughout the year only adds to the economic burden of treatment.

When presented with the upfront investment cost of home phototherapy, patients often believe it will be more expensive than standard outpatient phototherapy. Therefore, it would be beneficial if physicians educated patients regarding the total costs of phototherapy, including direct and indirect costs of travel. Although the estimates used in this analysis were conservative and the true cost of frequent commuting to the dermatologist is likely to be higher, it is at the very least a starting point by which to gauge whether or not this is a conversation worth having with your particular patient based on where he/she lives. After total costs are reviewed, patients may opt for home phototherapy because of the overall cost savings.

In this study we have provided general estimates of the cost-burden associated with 3 months of in-office phototherapy. However, this analysis is not intended as financial advice. To truly determine if it is cost-effective to receive phototherapy in the clinic versus purchasing a home light unit, patients need to individually assess their own personal financial situation and preferences for treatment.

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Tables and Figures

Table 1. Patients' cost for office-based phototherapy sensitivity analysis

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Table 2. Differences in cost based on fuel efficiency