

Are Narrow-Band Ultraviolet B Home Units a Viable Option for Continuous or Maintenance Therapy of Photoresponsive Diseases?

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Background: Phototherapy is an effective treatment for several photoresponsive diseases. Many patients are unable to attend hospital-based treatment and prefer home phototherapy.

Objectives: The purpose of this study is to survey patients who were prescribed home phototherapy to determine the viability of narrow-band ultraviolet B home units in the continuous or maintenance treatment of photoresponsive diseases.

Methods: A patient questionnaire was prepared focusing on different areas of interest: the reason for choosing home therapy, appropriate teaching, previous medical treatment, present exposure therapy, improvement of the condition, side effects, regular dermatologic follow-ups, and the effectiveness of this approach. Twenty-seven patients who attended the photodermatology clinics at the Sisters of Charity of Ottawa Health Service at the Elisabeth Bruyère Health Centre in Ottawa and the Ottawa Hospital Civic Campus were contacted, and they completed a questionnaire by telephone or electronic mail.

Results: Twenty-five patients completed the questionnaire. One refused to participate, and one was out of the country. The main reasons for choosing home phototherapy were time (40%), travel expenses (25%), difficulty with work schedule (17%), and recommendation by a physician (6%). Other reasons included loss of earnings, personal stress, knowledge that the disease recurs when phototherapy is discontinued, moving from the city, personal stress, and the convenience of being at home. Regarding the effectiveness of the home phototherapy, 24 patients (96%) viewed the home unit approach to be effective. All patients agreed that they would continue the treatment; they would repeat it, and they would recommend it. Few patients reported side effects, such as erythema (36%), blisters (1%), pruritus (8%), and dryness (1%). Fourteen patients (56%) reported not experiencing any side effects.

Conclusion: Narrow-band ultraviolet B home phototherapy was found to be an effective form of maintenance therapy for photoresponsive diseases. It is safe and presents few side effects when patients receive appropriate guidelines, teaching, and follow-ups.

Antécédents: La photothérapie est un traitement efficace pour plusieurs maladies qui réagissent à la lumière. De nombreux patients sont incapables de suivre des traitements à l'hôpital, préférant la photothérapie à domicile.

Objectifs: L'objectif de la présente étude est d'effectuer un sondage auprès des patients auxquels un traitement de photothérapie à domicile a été prescrit, dans l'objectif d'évaluer la viabilité des unités UVB à bande étroite dans le traitement, continu ou d'entretien, à domicile de maladies réagissant à la lumière.

Méthodes: Un questionnaire destiné aux patients a été préparé. Ce questionnaire est axé sur divers aspects d'intérêt : raisons motivant le choix de la photothérapie à domicile, pertinence de la formation, traitements médicaux précédents, traitement d'exposition actuel, amélioration du cas, effets secondaires, suivis réguliers auprès d'un dermatologue et efficacité de l'approche. Vingt-sept patients ayant participé aux cliniques de photothérapie du Service de Santé des Sœurs de la Charité d'Ottawa (Centre de santé Élisabeth-Bruyère) et de l'Hôpital d'Ottawa (Campus général) ont été contactés et ont rempli le questionnaire par téléphone ou par courriel.

Résultats: Vingt-cinq patients ont rempli le questionnaire. Un patient a refusé de participer et un était en voyage. Les principales raisons motivant le choix de la photothérapie à domicile étaient le temps (40 %), les coûts du déplacement (25 %), l'horaire du travail (17 %), et la recommandation par un médecin (6 %). Parmi les autres raisons on retrouve : la perte du revenu, le stress, la récurrence de la maladie lorsque la photothérapie est interrompue, le déménagement de la ville, le stress personnel, et le confort assuré par la présence chez soi. Quant à l'efficacité de la photothérapie à domicile, 24 répondants (96 %) considèrent cette approche comme étant

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efficace. Tous les patients ont convenu qu'ils poursuivront le traitement, qu'ils le reprendraient et qu'ils le recommanderaient à d'autres. Quelques patients ont fait part d'effets secondaires, tels que l'érythème (36 %), des pustules (1 %), du prurit (8 %), et une sécheresse de la peau (1 %). Quatorze patients (56 %) n'ont rapporté aucun effet secondaire.

Conclusion: La photothérapie UVB à bande étroite à domicile s'est révélée une forme efficace de thérapie d'entretien pour les maladies réagissant à la lumière. Il s'agit d'un traitement sécuritaire présentant peu d'effets secondaires lorsque le patient reçoit les lignes directrices appropriées, une formation adéquate et un suivi.

THE AMERICAN ACADEMY OF DERMATOLOGY defines phototherapy as the exposure to nonionizing radiation for therapeutic benefit. It may involve exposure to ultraviolet (UV)A, UVB, or various combinations. Phototherapy can be administered in inpatient hospital settings, hospital clinics, daycare centers, and doctor's offices, as well as for home therapy.¹ Many diseases have been reported to respond to this treatment, including psoriasis,² hand dermatitis,³ mycosis fungoides,⁴ pruritus, pityriasis rosea, lichen planus, pityriasis lichenoides, and many more.

Home UV radiation therapy was used with success in the past for the treatment of psoriasis and other disorders.⁵ Psoralen plus ultraviolet A (PUVA) was the first UV modality to display the maintenance of the initial clearing of psoriasis when a treatment is personalized to the individual's response.⁶ As a home therapy, PUVA did not seem to be an appropriate option since the psoralen taken by mouth or put into the bath water added a degree of complexity that would necessitate extreme caution.¹ Home broad-band ultraviolet B (BB-UVB) was considered successful in previous studies,^{7,8} yet it seemed to be a suboptimal treatment, with greater risks than phototherapy in a hospital setting.⁹ This source of radiation emits a broad-band spectrum in the range of 280 to 320 nm, with a therapeutic effect in the range of 310 to 315 nm and maximum phototoxicity effects around 290 to 300 nm. With the advent of narrow-band ultraviolet B (NB-UVB) that primarily emits 311 to 313 nm, there is less skin damage, less radiation for more effective treatment of psoriasis, and no greater long-term skin cancer than with BB-UVB.¹⁰

At a recent meeting of Canadian dermatologists, there were diverging opinions as to the appropriateness of home NB-UVB phototherapy as an option for the continuous or maintenance treatment of photoresponsive diseases. In a literature review to clarify this issue, no Canadian articles were found on home phototherapy and only one study by the British Photodermatology Group.¹¹ The present article is a retrospective study looking at patients in the Ottawa area on NB-UVB home phototherapy and assessing the viability and safety of such treatment.

Method

Patient Identification

Twenty-five patients who attended the photodermatology clinics at the Sisters of Charity of Ottawa Health Service at the Elisabeth Bruyère Health Centre in Ottawa and the Ottawa Hospital Civic Campus were prescribed a narrow-band home unit. SolArc Systems Inc. (Barrie, ON), makers of all of the home units used by this patient population, provided the contact information, diagnosis, model and serial numbers of the home unit, and the date of purchase for each patient. SolArc Systems Inc. provided no financial support for this study.

Patient Questionnaire

A patient questionnaire was prepared focusing on different areas of interest: the reason for choosing home therapy, appropriate teaching, previous medical treatment, present exposure therapy, improvement of the condition, side effects, regular dermatologic follow-ups, and the effectiveness of this approach (Appendix).

Survey

Twenty-seven patients were contacted by telephone and electronic mail. A fourth-year medical student at the University of Ottawa (K.-A.H.) made all patient contacts to avoid any intimidation bias by the treating dermatologist (J.-P.D.). One patient refused to participate, and one patient was out of the country.

Results

A sample of 25 patients who had already responded favorably to phototherapy at the Sisters of Charity of Ottawa Health Service and at the Ottawa Hospital Civic Campus phototherapy clinics were prescribed an NB-UVB home unit. These surveyed patients included 12 women and 13 men with a mean age of 49 years and an age range varying from 10 to 72 years. Figure 1 summarizes the diseases for which patients are treated. Seven patients

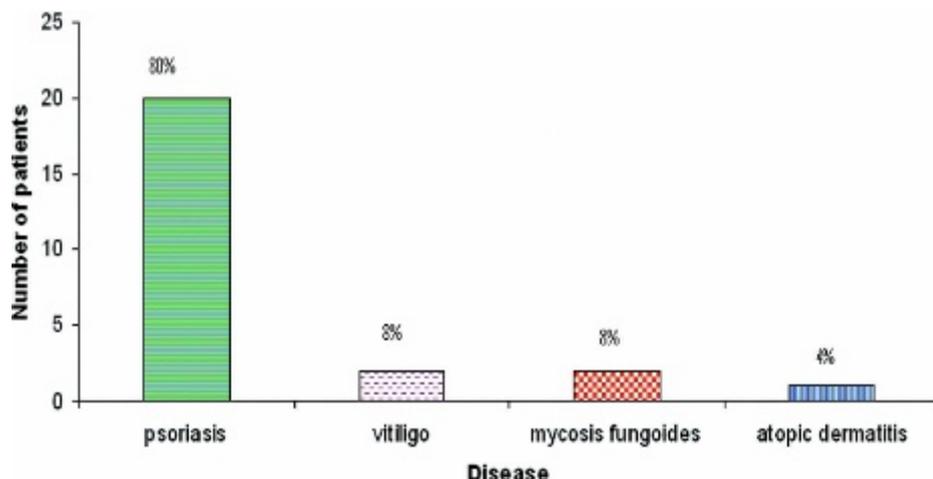


Figure 1. Patients with various diseases undergoing home phototherapy.

(28%) had purchased an NB-UVB hand and foot unit (SolArc Systems/SolRx 500 Series 550UVB-NB at 16 milliwatts/cm² at 3 inches), 6 patients (24%) had the NB-UVB stand-up unit with six bulbs (SolArc Systems/SolRx 1000 Series 1760UVB-NB at 4.5 milliwatts/cm² at 10 inches), and 12 patients (48%) had the NB-UVB stand-up unit with eight bulbs (SolArc Systems/SolRx 1000 Series 1780UVB-NB at 5 milliwatts/cm² at 10 inches) (Figure 2). The 44-bulb clinic unit, on average, would have an irradiance of 13 milliwatts/cm².

All patients had received documentation, including a user’s manual with exposure guidelines, with the purchase of their product. Twenty-four patients (96%) believed that the information received by SolArc Systems Inc. was helpful, with 16% indicating that they had received appropriate teaching from SolArc Systems Inc. only, 28% obtained the teaching from the nurses at the photodermatology clinics, and 40% obtained information from both SolArc Systems Inc. and the nurses. Only 3 patients acquired full coverage for the purchase of their home unit by insurance companies, 6 patients had only a percentage, varying from 60 to 90%, and 16 patients had absolutely no coverage.

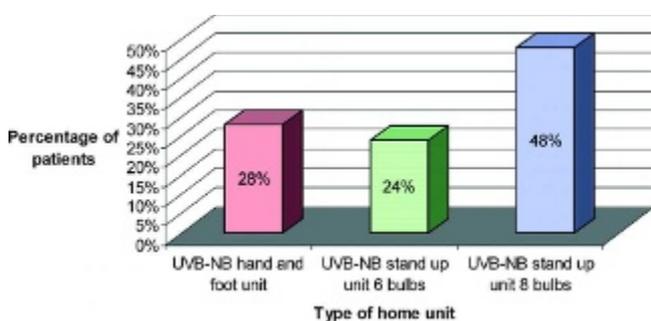


Figure 2. Type of home unit used by patients. UVB-NB = ultraviolet B narrow-band.

The main reasons for choosing home phototherapy were fewer travel expenses, less time required, less difficulty with work schedule, and recommendation by the dermatologist. Other reasons included loss of earnings, personal stress, knowledge that the disease recurs when phototherapy is discontinued, moving from the city, personal stress, and the convenience of being at home. Sixteen patients felt that the home phototherapy generated fewer expenses, with monthly savings varying from \$20 to \$600 depending on the distance traveled and associated expenses and on the work hours missed. All patients undergoing the home therapy have previously received one or multiple types of hospital phototherapy. They included NB-UVB hand and foot, 24%; NB-UVB stand-up unit, 80%; BB-UVB, 16%; PUVA bath, 40%; and PUVA systemic, 4%. Regarding oral therapies, 48% of patients had no previous medical treatment, 28% have taken methotrexate, 24% received acitretin (Soriatane), 4% received cyclosporine, and none were on biologics. As for maintaining regular dermatologic follow-ups, 1 patient (4%) was seen every 3 months, 11 patients (44%) had regular 6-month appointments, 3 patients (12%) had yearly visits, and 9 patients (36%) had no specific follow-ups.

The results of the exposure on the present therapy are summarized in Table 1. The duration on home therapy varied from 2 weeks to 1.5 years, and the number of treatments to date was in the range of 10 to 200 treatments. Forty-four percent of patients were on a continuous treatment, and 56% were on a maintenance treatment. All patients followed appropriate safety measures, as described in their user’s manual. Twenty-three patients (92%) felt that the ease of operation of the home unit was high, and only two patients said that it was average. Regarding the home therapy, 12 patients (48%) described their improvement to be marked, 12 patients

Table 1. Details of Therapy at the Time of the Survey

<i>Questions of Phototherapy</i>	<i>n (%) of Patients</i>
Number of exposures in a week	
1	1 (4)
2	2 (8)
3	7 (28)
4	3 (12)
5	11 (44)
7	1 (4)
Duration on home therapy	
Range	2 wk to 1.5 yr
Mean	9.6 mo
Maximum number of minutes reached	
1.5	2 (8)
2	2 (8)
3	2 (8)
4	7 (28)
5	6 (24)
6	3 (12)
8	2 (8)
10	1 (4)
Number of treatment to date	
Range	10–200
Mean	82 treatments
Type of exposure	
Front, back, and sides	12 (48)
Front and back only	8 (32)
Legs only	2 (8)
Arms only	1 (4)
Hands only	1 (4)
Face only	1 (4)
Using a stool	
Yes	10 (40)
No	15 (60)
Type of therapy	
Continuous	11 (44)
Maintenance	14 (56)
Safety measures according to the user's manual	
Yes	25 (100)

BB = broad-band; NB = narrow-band; UVB = ultraviolet B.

said that it was average, and only 1 patient reported that it was minimal. In comparison between home versus hospital phototherapy, 6 patients (25%) regarded home treatment to be superior, 12 patients (48%) had similar results, and 7 patients viewed the hospital therapy as more effective. The

psychological support given by the staff at the photodermatology clinics was viewed to be better by 10 patients (40%). From the remaining, 10 patients had equivalent support at home and in the hospital setting and 5 patients had more suitable psychological support at home. Few

patients reported side effects, as shown in Figure 3, such as erythema (36%), blisters (1%), pruritus (8%), and dryness (1%). Fourteen patients (56%) reported not experiencing any side effects.

Regarding the effectiveness of the home phototherapy, 24 patients (96%) viewed the home unit approach to be effective, and only 1 patient was not yet convinced. All patients (see Figure 3) agreed that they would continue the treatment; they would repeat it, and they would recommend it.

Discussion

Home phototherapy is an effective approach for the treatment of photoresponsive diseases, such as psoriasis, vitiligo, atopic dermatitis, and mycosis fungoides. This is not surprising as previous experience with BB-UVB and NB-UVB showed that treatment could be effective.^{2,7,9,12} All patients treated found this approach effective, with the exception of one patient, who was not completely convinced as he had started the treatment 2 weeks prior to the study.

Patients who underwent home treatment were primarily concerned with the time involved in attending the hospital to receive treatment. Because of their travel expenses and their work difficulties, they were prescribed home therapy. A prerequisite to all patients was a previous therapeutic response to hospital phototherapy. Both SolArc Systems Inc. and the nurses at the photodermatology clinics were involved in providing appropriate teaching for new home unit owners. Nurses and dermatologists who do not operate a phototherapy center should be aware of the detailed instructions provided to their patients by SolArc Systems Inc. Their role becomes more one of professional follow-up rather than one of education on the operation of the home unit. Although patients did not have any problems

operating the machines, most of them had difficulties dealing with insurance companies who refused to cover the home units. As per the SolArc Systems Inc. Web site <www.solarcsystem.com>, the cost before taxes for an NB-UVB six-bulb stand-up unit is \$2,395, it is \$2,695 for an NB-UVB eight-bulbs stand-up unit, and the hand and foot unit is around \$1,795. Despite the fact that the cost of the units was often not covered by insurance companies, patients considered this to be a worthy cost to bear to achieve maintenance of their photoresponsive disease and were ready to recommend this option to others.

More than half of the patients were on a maintenance treatment as they have achieved resolution of lesions. It appears that long-term maintenance can be achieved with doses lower than those used in the clearing phase with a dosage less than one-quarter the minimum erythema dose.¹² During the course of home phototherapy, only one patient reported minimal improvement and few patients reported that the hospital therapy was more effective than home therapy. All of these patients explained that in comparison with their previous hospital treatment, longer time is needed to reach the same results and the light intensity on their home unit is lower than the hospital units. Over time, it seems that all patients achieve appropriate clearing and recommend the home treatment. Erythema seems to be the most reported side effect in previous studies¹² and by the patients. This side effect was experienced very briefly by patients as they started their therapy or when they exceeded the time and number of exposures. Reading the user's manual and appropriate teaching are therefore essential in preventing any major side effects. Regular dermatologic follow-up is also extremely important for all patients on home phototherapy because the prescribing dermatologist has the medicolegal responsibility. The general guidelines recommend 3 to 6-month follow-ups while on home phototherapy to ensure professional assessment of the clinical progress of the disease and enable skin cancer surveillance.^{1,8} Although patients who missed or neglected follow-up appointments indicated no lesions and being on maintenance therapy, they were strongly advised to have regular appointments.

In conclusion, NB-UVB home phototherapy was found to be very effective in comparison with hospital therapy. It is safe and presents few side effects when patients receive appropriate guidelines, teaching, and follow-ups. Not only is it convenient; it also provides effective savings for patients who are unable to attend the hospital owing to time, travel, and interference with work schedule. All patients on home therapy were satisfied with their

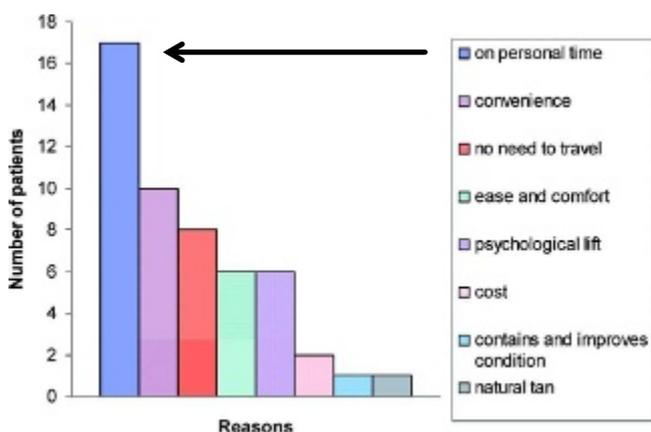


Figure 3. Patients' reasons for recommending home phototherapy.

treatment, plan to continue it, and recommend it to others in similar situations.

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Appendix: Patient Questionnaire

Patient Identification:

Age:

Sex:

Disease

- Psoriasis
- Atopic dermatitis
- Mycosis fungoides
- Parapsoriasis
- Itch
- Hand and foot dermatitis
- Vitiligo
- Other: _____

Type of Home Unit

- Narrow-band UVB hand and foot unit
- NB-UVB stand-up unit, 6 bulbs
- 8 bulbs
- BB-UVB

Was the home unit covered by insurance?

- If coverage:
 - Full coverage?
 - Percentage of coverage?
 - Name of insurance company: _____
- No coverage
 - Name of insurance company: _____

Reason for Choosing Home Therapy

What is the reason for choosing home therapy versus hospital therapy?

- Travel expenses
- Loss of earnings
- Time
- Difficulty with work schedule
- Childcare support
- Other: _____

Do you feel that this home therapy generated fewer expenses and savings?

- If yes, can you give an estimate of monthly or yearly savings? _____

Previous Medical Treatment

Did you receive a previous medical treatment before?

- Methotrexate
- Acitretin (Soriatane)
- Cyclosporine
- Biologics (eg, Amevive)

Did you receive previous phototherapy at a hospital?

- If yes, what kind?
 - Narrow-band UVB hand and foot unit
 - NB-UVB stand-up unit
 - BB-UVB
 - PUVA
 - Bath
 - Systemic

Facility to Use

What is your facility to operate the home unit?

- Low
- Average
- High

Improvement

How would you grade the improvement of your condition on home therapy?

- Minimal
- Moderate
- Marked

Would you consider the treatment at home

- less?
- equal?
- or more effective compared with the hospital clinic?

Do you still have lesions?

- If yes, where?
 - Face
 - Arms
 - Hands
 - Legs
 - Thighs
 - Feet
 - Chest
 - Back

Would you consider the psychological support at home versus hospital care to be

- the same as in the hospital.
- better in the hospital.
- better at home.

Appropriate Teaching

Did you find the documentation received by SolArc helpful?

Did you receive appropriate teaching for using the home unit?

- If yes, by who?
 - Nurse
 - SolArc

Exposures on Present Therapy

How many exposures do you have in a week?

Exposures:

- What is the maximum number of minutes of exposure you have reached?
- Do you expose
 - the front, back, and the sides?
 - or only the front and back?
- Do you use a stool to get more intensity of light to the lower legs?
- How many treatments to date have you had?
- Are you on
 - a continuous treatment?
 - maintenance therapy?
- Do you use appropriate safety measures, such as eye protection?
- How long have you been using the home therapy?

Side Effects

What are the side effects of the home therapy?

- Redness
- Pain
- Blisters
- Others: _____
- None

Follow-Up

Do you have regular follow-ups with your dermatologist?

- How often?

Effectiveness

In general, do you find the home unit approach effective?

Do you plan to continue with the home treatment?

Would you do it again?

Would you recommend it?

Why?