Efficacy of Acitretin and Commercial Tanning Bed Therapy for Psoriasis

Christopher S. Carlin, MD; Kristina P. Callis, MD; Gerald G. Krueger, MD

Objective: To assess the efficacy of acitretin and commercial tanning bed therapy for the treatment of moderate to severe chronic plaque-type psoriasis.

Design: Retrospective medical record review and telephone survey of subjects and prospective open-label trial.

Setting: University dermatology clinic.

Patients: The study population comprised 26 subjects in the retrospective study and 17 subjects in the prospective study, all with moderate to severe plaque-type psoriasis.

Intervention: Twelve weeks of daily oral acitretin (25 mg) therapy and commercial tanning bed UV exposure (mean UV-B output of 4.7%) for 4 to 5 days per week.

Results: In the retrospective review, 19 (83%) of 23 subjects had clearance or near clearance, 2 (9%) of 23 had moderate improvement, and 2 (9%) of 23 had no improvement. Patients reported a high degree of satisfaction with the treatment. In the prospective trial, the Psoriasis Area and Severity Index (PASI) and National Psoriasis Foundation scores decreased an average of 78.6% and 79.0% from baseline, respectively. A reduction from baseline in the PASI score of 50% and 75% (PASI 50 and PASI 75) was achieved by 13 (76%) and 10 (59%) patients, respectively. Adverse events were generally mild to moderate.

Conclusions: Acitretin use in combination with commercial tanning bed therapy appears to be effective and useful for psoriasis in areas without access to physician-directed phototherapy. The variability of tanning salon light and quality mandates caution when using this therapy.

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The combination of phototherapy with retinoids has been shown to be advantageous over either therapy alone in the treatment of moderate to severe psoriasis. The combination of UV-B with acitretin therapy (re-UV-B) and the combination of psoralen with UV-A (PUVA) with acitretin or etretinate therapy (re-PUVA) have resulted in marked improvement in psoriasis with clearance rates of up to 100%. These regimens have been shown to work more rapidly than retinoids or phototherapy alone. Since lower daily doses of retinoids are generally sufficient in combination treatment, tolerability is improved. Furthermore, the number and duration of UV treatments can be significantly reduced, potentially mitigating the long-term hazards of UV exposure.

Although physicians do not frequently advocate commercial tanning bed use, patients with psoriasis are known to use commercial tanning bed light for treatment of their psoriasis. A US survey of 113 psoriasis patients who had used commercial tanning bed light reported that 68% believed it to be an effective treatment modality. A prospective study involving 20 patients with moderate to severe psoriasis treated with commercial tanning beds for 6 weeks showed that 80% of patients had a clinical improvement in the Psoriasis Area and Severity Index (PASI) score. A recent placebo-controlled study that analyzed 38 patients who used UV-A tanning beds showed a small but statistically significant difference in reduction of PASI scores in 4 weeks.

See also pages 443 and 520

Because other treatment modalities of UV light have been shown to act synergistically with retinoids, it is important to ascertain whether commercial tanning bed light would also augment the therapeutic response to retinoids. To our knowledge, at
present no studies exist that detail the efficacy of the combination of retinoid and commercial tanning bed therapy. Because the University of Utah, Salt Lake City, serves a large population of rural patients from the surrounding area and neighboring states, PUVA and UV-B phototherapy often are not reasonable options. From 1997 to 2000, the combination of retinoid and commercial tanning therapy (re-TBUV) was used in 26 patients with plaque-type psoriasis. Based on the encouraging results, a prospective study was then performed on 17 patients to further validate the combination treatment. In the present study, we summarize our experience with acitretin use in combination with commercial TBUV therapy.

METHODS

RETROSPECTIVE STUDY

A total of 26 patients attending the Dermatology Clinics at the University of Utah Health Sciences Center received retinoids (23 received acitretin and 1 received isotretinoin) in combination with commercial tanning bed therapy from 1997 to 1999. A retrospective medical record review was performed on all 26 patients to document severity of psoriasis, duration of psoriasis, past systemic and light therapies, dosage of acitretin, type of tanning bed used, and duration of the combination treatment.

Patients were retrospectively surveyed regarding compliance and satisfaction on a scale of 0% to 100%, with 100% being the best. Patients provided a global assessment of improvement and satisfaction on a scale of 0% to 100%, with 100% being the best. Patients who cleared before 12 weeks.

Prospective Open Trial Tanning Bed Data*

<table>
<thead>
<tr>
<th>Salon Site</th>
<th>Lamp Type (Manufacturer)</th>
<th>Manufacturer-Reported UV-B Output, %</th>
<th>No. of Patients</th>
<th>Measured UV-B Output, %</th>
<th>Measured UV-A + UV-B Output, mW/cm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 X5000 (Interlectric Corporation, Warren, Pa)</td>
<td>5.0</td>
<td>4</td>
<td>4.9</td>
<td>4.6</td>
<td>4.6</td>
</tr>
<tr>
<td>2 Midday Sun 5.0 (Light Sources, Inc, Orange, Conn)</td>
<td>5.0</td>
<td>6</td>
<td>4.8</td>
<td>4.8</td>
<td>4.7</td>
</tr>
<tr>
<td>3 Midday Sun 5.0 (Light Sources, Inc)</td>
<td>5.0</td>
<td>3</td>
<td>4.7</td>
<td>4.7</td>
<td>4.7</td>
</tr>
<tr>
<td>4 Genesis 105 (Sun Industries, Inc, Jonesboro, Ark)</td>
<td>4.6</td>
<td>3</td>
<td>4.6</td>
<td>4.3</td>
<td>4.6</td>
</tr>
</tbody>
</table>

*Does not include data from patient who used home unit.

PROSPECTIVE STUDY

A total of 17 patients were enrolled in the prospective trial. Patients selected for inclusion were at least 18 years old with stable or worsening moderate to severe plaque-type psoriasis. Patients excluded from the study included women of childbearing potential (unless surgically sterile), men who would not consent to practice birth control during the study, patients with known sensitivity to light or retinoids, patients requiring prolonged exposure to non-study-related UV light, patients with moderate to severe liver or kidney disease, and patients with skin disorders in the treatment area that would interfere with clinical assessment. The protocol was approved by the University of Utah institutional review board, and all patients signed the approved consent form.

Patients were prescribed acitretin, 25 mg/d, and 5 to 7 tanning sessions per week for a maximum of 12 weeks. Patients were advised to begin tanning bed exposure at 2 to 3 minutes per session to increase exposure by 1 minute per session until reaching a maximum exposure time (30 minutes) was reached. Erythema and protection was to be worn at all times within the tanning bed. Induction of slight erythema per light treatment was the goal. If moderate erythema was present, the previous exposure dose was maintained until regression of erythema occurred. Other than 2 patients who used a concomitant cortico-steroid or calcipotriene on their scalp, no topical agent besides a moisturizer was used on the skin by any patient. Acitretin use was discontinued and tanning bed visits were reduced in patients who cleared before 12 weeks.

Nineteen Wolff tanning beds (Wolff System Technology Corporation, Marietta, Ga) containing lamps that had a manufacturer reported UV-B output close to 5% were evaluated. Tanning bed at 4 different salons in the north, south, east, and west of the Salt Lake Valley were selected for use based on comparable percent UV-B output. Output of UV light of the selected tanning beds was measured on 6 weeks for the duration of the study using a portable UV meter (IL-1330; International Light, Newburyport, Mass) with separate probes to measure UV-A and UV-B output (Table 1). After lamps were allowed to warm up for 20 minutes, output measurements for each bed was averaged from 6 readings from the center and 10 inches from each end of the top and bottom bed halves. One patient used a Wolff bed at home that emitted similar light readings (UV-B=4.1%) as the other beds.

Each patient was evaluated at initiation and every 2 weeks for 12 weeks using the PASI score and the National Psoriasis Foundation (NPF) psoriasis score. The NPF score (Table 2) is totaled by adding the individual scores of 5 different components: (1) induration of 2 target lesions, (2) body surface area (BSA), (3) physician global assessment, (4) patient global assessment, and (5) patient assessment of itching. The NPF psoriasis score reference card was used to assess induration. The physician global assessment component is static and determined by averaging induration, erythema, and scale of all psoriatic lesions. Similar to the PASI score, an NPF score of 0 signifies clearance. The maximum NPF score is 30.

Appropriate laboratory tests (fasting serum cholesterol, triglyceride, complete blood count, basic metabolic panel, and hepatic function tests) were performed on weeks 0, 4, 8, and 12. Adverse events were assessed at each visit.

Efficacy data were analyzed on an intent-to-treat basis. When a mean was calculated for the group, the results were expressed as the mean ± SEM. Otherwise, all results were expressed as the mean ± SEM.
pressed as mean ± SD. The Prophet 5.0 statistics program by BBN Systems and Technology, Cambridge, Mass, was used for statistical analysis of the data. The primary outcome measure was the PASI score. Body surface area and the NPF score were secondary outcome measures. The PASI and NPF scores at each visit were compared with baseline using the Kruskal-Wallis test with a significance level of 5%.

### RESULTS

#### RETROSPECTIVE STUDY

A total of 8 women and 18 men aged 19 to 72 years were enrolled in the retrospective study (Table 3). All patients had moderate to severe plaque-type psoriasis for an average duration of 17.3 years. Most patients had used at least 1 systemic agent in the past. The average dosage of acitretin was 24.3 mg/d, and the average number of light treatments per week was 4.7. Therapy outcome was grouped into 5 categories of global improvement compared with baseline: clearance (≥90% improvement), near clearance (≥75% to <90% improvement), moderate improvement (≥50% to <75% improvement), mild improvement (25% to <50% improvement), and no change (0% to <25% improvement). No patient experienced worsening of psoriasis. A follow-up physical examination was available in 23 patients. Nineteen (83%) of 23 patients had moderate to severe plaque-type psoriasis for an average duration of 17.3 years. Most patients had used at least 1 systemic agent in the past. The average dosage of acitretin was 24.3 mg/d, and the average number of light treatments per week was 4.7. Therapy outcome was grouped into 5 categories of global improvement compared with baseline: clearance (≥90% improvement), near clearance (≥75% to <90% improvement), moderate improvement (≥50% to <75% improvement), mild improvement (25% to <50% improvement), and no change (0% to <25% improvement). No patient experienced worsening of psoriasis. A follow-up physical examination was available in 23 patients. Nineteen (83%) of 23
patients experienced clearance or near clearance of their psoriasis (Figure 1). The results of the patient survey, completed by 24 of the 26 patients, are given in the tabulation below.

<table>
<thead>
<tr>
<th>Survey Question Scale</th>
<th>Mean ± SD Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank psoriasis at end of treatment (1-10)</td>
<td>2.5 ± 1.7</td>
</tr>
<tr>
<td>Patient report of improvement (0%-100%)</td>
<td>73.5% ± 29.9%</td>
</tr>
<tr>
<td>Patient satisfaction (0%-100%)</td>
<td>71.7% ± 29.5%</td>
</tr>
<tr>
<td>Compliance (0%-100%)</td>
<td>76.9% ± 18.4%</td>
</tr>
</tbody>
</table>

PROSPECTIVE STUDY

A total of 4 women and 13 men aged 25 to 67 years were enrolled (Table 3). All patients had moderate to severe plaque-type psoriasis for an average duration of 18.6 years. Because the first 2 to 3 minutes of UV-B exposure was approximately 20% lower than the maximum output, the average initial dose of UV-B was 57 to 95 mJ. The average total doses of UV-A and UV-B per patient were 622.6 J/cm² and 29.9 J/cm², respectively, for 9.5 weeks.

Of the 17 patients, 14 patients completed the study. Two patients were withdrawn within the first 4 weeks owing to noncompliance and personal issues. One patient was withdrawn at week 11 due to an asthma exacerbation requiring systemic corticosteroid treatment (only data collected prior to steroid treatment were used in our analysis).

The PASI and NPF scores at weeks 2, 4, 6, 8, 10, and 12 were compared with baseline values (Figure 2). The mean ± SD baseline and week 12 PASI scores were 10.9 ± 4.5 and 2.1 ± 2.5, respectively. The mean ± SD baseline and week 12 NPF scores were 20.5 ± 3.0 and 4.4 ± 4.9, respectively. A clinically significant (P < .05) difference from baseline was seen at 4 weeks and beyond in the NPF score and 6 weeks and beyond in the PASI score. The overall mean percent reductions of PASI and NPF scores were 78.6% and 79.0%, respectively. Patients who began with moderate psoriasis experienced a 72.2% reduction in PASI score, whereas those beginning with severe psoriasis had an average reduction of 85.9%.

The patients were grouped according to percent reduction in PASI (Figure 3). Clearance was considered to be a reduction in PASI score of at least 90%. Four patients achieved a PASI and/or NPF score of 0 (1 at week 6, 2 at week 8, and 1 at week 10) and were asked to discontinue acitretin therapy and reduce light treatments to twice per week. Each of these patients remained clear at week 12. Two patients who continued to improve but had not yet reached clearance opted to continue the combination treatment after termination of the study.

Adverse event data were collected in both the retrospective and prospective studies (Table 4). In the retrospective study, the most commonly reported adverse events were cheilitis (17 patients [65%]) and dry skin (9 patients [35%]); none reported “sunburn.” One patient terminated treatment secondary to headaches, and another discontinued owing to hair loss. In the prospective study, the most common adverse effects were pruritus, dry skin, scaling, cheilitis, and a mildly erythematous, single-episode (grade 1) tanning bed burn. Nearly all adverse events were mild and resolved at termination of therapy, with the exception of 1 case of mild hair loss. One serious adverse event, an asthma exacerbation requiring hospit-
Adverse Events May Also Be Associated with Light Therapy. Adverse effects of UV-A, UV-B, and/or TBUV light include erythema, pruritus, phototoxic reactions, nausea, photoaging, increased lentigines, irregular pigmentation, nonmelanoma, and perhaps melanoma skin cancer.21,22 Both short- and long-term adverse effects are believed to be lower in retinoid and UV light combination treatment as studies of re-PUVA and re-UV-B have shown a reduction in dose and number of treatments vs their respective monotherapies.23 Although there is no standard for dosing therapy with tanning beds with which we could compare our values, the 2 studies involving tanning bed monotherapy used a lower number and duration of light treatments (3 treatments per week for 4-6 weeks vs 4-5 treatments per week for 12 weeks).3,12 It should be noted that the reduction in PASI score for these studies was modest. Only 1 known study has shown benefit from UV-A alone.24 In this study, patients were exposed to a much higher levels of UV-A (1800-6986 J/cm²) than the exposure dose in our study.

While the total dose of UV-A and UV-B is higher in our study than some past UV or UV-retinoid combination therapy, was believed to be unrelated to the acitretin and/or tanning bed therapy.

### Comment

The data from both the retrospective medical record review and prospective open trial provide strong evidence that re-TBUV is an effective treatment for psoriasis. Patients in our population experienced a respectable reduction in PASI score of 79% and excellent clearance rates of 47% to 52%. Patients who cleared before the prospective trial termination were maintained clear for the remainder of the study with only 2 UV sessions per week and without any further doses of acitretin. In the medical record review, all patients who cleared were maintained clear for at least 2 months with 2 to 3 UV light treatments per week. Acitretin in these cases appears to act as the “accelerator of clinical response,” which can be tapered off after maximal improvement while clearance is maintained with low-frequency use of TBUV.15

Reviewing response based on initial severity shows that patients who initiated the prospective study with severe psoriasis experienced higher rates of PASI reduction than those with moderate psoriasis (85.9% vs 72.2%). This unexpected finding indicates that re-TBUV efficacy might improve as the severity increases. Although a larger study would be needed to prove this point, it is clear that the response we report is not because of a greater response in those with less severe disease.

A principal benefit of any combination treatment is increased efficacy over monotherapy. Comparison of our study to published studies of UV or acitretin monotherapy—or their combination therapies—cannot be made because the populations are different. However, if large differences are present it can be argued that the combination likely provides an additive beneficial effect. Both the retrospective and prospective studies of re-TBUV showed much higher clearance rates than past studies of acitretin or tanning bed monotherapy. A meta-analysis of 12 studies of acitretin monotherapy reported that only 30.4% of patients with plaque-type psoriasis achieved clearance.16 Also, studies of TBUV alone showed only a 6% to 37% decrease in PASI.11,12

When reviewed with the results reported by other retinoid and UV light combination therapy studies, re-TBUV fairs well. The clearance achieved in the present study is lower than the 94% to 100% clearance reported in placebo-controlled trials with acitretin plus PUVA therapy25 and acitretin plus bath PUVA therapy.4 However, the 79% reduction in PASI achieved in the prospective phase of our study compares favorably to 2 prospective studies of patients treated with acitretin plus UV-B that showed a 74% reduction at 12 weeks and 79% reduction at 8 weeks.17,18

A significant benefit of combination therapies for psoriasis is the reduction of adverse effects. We conjecture that this will also be the case with re-TBUV. Acitretin efficacy and adverse effects are dose-dependent; thus, the higher doses needed for adequate treatment in monotherapy may produce intolerable adverse effects for many patients.19,20 Because the acitretin dose in both the retrospective and prospective studies was lower than the average monotherapy dose, adverse events should be much lower.3 Only 3 patients of the 42 patients involved in both studies discontinued therapy due to adverse effects. No patient had laboratory test results that were abnormal to the point that required termination (>2 times the upper limit of normal). Furthermore, in the prospective study all but 3 of the adverse events were reported as mild. Similar to other studies involving acitretin that show a slight transient exacerbation before improvement,19 an initial increase in BSA occurred in many patients in the second week of evaluation, which was absent by week 4. However, the overall PASI and NPF scores of week 2 showed a reduction from baseline due to a decrease in erythema, scaling, and induration.

### Table 4. Adverse Events Occurring More Than Once

<table>
<thead>
<tr>
<th>Adverse Events</th>
<th>Medical Record Review (n = 26)</th>
<th>Prospective Trial (n = 17)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheilitis</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Dry skin</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Mild tanning burn</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Itch</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Scaling</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Triglyceride elevation</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Insomnia</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Dry eyes/conjunctivitis</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>LFT elevation</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Sore throat</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Skin atrophy</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Dry nose</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>GI disturbances</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Emotional liability</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Dysesthesia</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Dry mouth</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Alopecia</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Abbreviations: GI, gastrointestinal; LFT, liver function test.

*Events reported once included scaling, erythematous rash, curly hair, dysuria, clouded sensorium, halitosis, asthma, myalgia/arthritis, epistaxis, nail dystrophy, nevus pigment, cough, ear tenderness, sinusitis, and moderate gastroenteritis.
tion studies, comparison with UV doses commonly received in phototherapy clinics shows similar values. In the phototherapy units at the University of Utah Dermatology Clinics, patients receiving 12 weeks of PUVA or re-PUVA may average a dose of 336 to 450 J/cm². Averages of UV-B or re-UV-B therapy dose averages 23 to 31 J/cm² of UV-B (plus the accompanying 336 to 450 J/cm² of UV-A, since the “UV-B lamp” also emits a percentage of UV-A light). Initial UV-B dose in the University of Utah Dermatology Clinics phototherapy units is approximately 100 mJ (30 seconds of exposure). In comparison, patients in our prospective study started at 2 to 3 minutes for an average initial dose of 57 to 95 mJ of UV-B.

Over the course of the present study, we had the opportunity to compare and contrast a new scoring system, the NPF psoriasis score, to the more traditional PASI score. Both scores showed similar overall reduction in psoriasis. The NPF score showed statistical significance of improvement relative to baseline at an earlier time point than the PASI score. This may be a reflection of the unique components of the NPF score, which places more weight on induration, a less volatile score, and less weight on erythema and scaling, which fluctuate more with environmental factors. The NPF score may prove to be a more meaningful measure of improvement because it includes a patient itch assessment and patient global evaluation, which takes into account factors such as psychological impact and discomfort due to psoriasis. Furthermore, the NPF score is not dependent on total BSA because it evaluates the percent reduction in BSA from baseline; thus, it may ultimately be more useful than the PASI score in comparing patients with widely differing BSA or in patients with mild to moderate psoriasis. This is the first indication that the NPF score may be an effective tool to assess psoriasis in clinical trials.

We recognize that our prospective study was limited in its lack of controls, absence of patient and observer blinding, and study population that was fewer than the hundreds of patients in phase 3 trials. A true comparison between the various treatment modalities would require a double-blind, placebo-controlled trial, which would be very costly and beyond the scope of our goal to assess the viability of the combination of acitretin and commercial tanning bed therapy. Hopefully, this report will prompt additional studies that compare re-TBUSV with placebo, monotherapies, and/or other retinoid and UV light combination therapies.

For physicians desiring to use re-TBUSV for their patients with psoriasis, caution must be used in selecting appropriate tanning salons and equipment. Tanning salons differ vastly in bed type used, lamps used, frequency of changing lamps, number of hours on each lamp, cleanliness, and the presence of knowledgeable and professional staff. Tanning bed lamps progressively lose their intensity and may not be as effective after a significant amount of usage. In our prospective study, we attempted to select salons with knowledgeable staff, evidence of greater cleanliness, and more safety precautions than other salons we visited. We selected Wolff beds with approximately 5% UV-B output based on a 1993 study in the United States that found most (81%) tanning beds to be of that make and equipped with bulbs that had a UV-B output of 4.6%. In our survey, we found that only 25% to 50% of the salons we tested were using Wolff beds with lamps emitting approximately 5% UV-B. Many other bed types were available, and lamp UV-B output varied widely from 1% to 8%. Lamp type may also vary per country, since most tanning beds found in the United Kingdom are reported to have a percent UV-B emission that ranges between 0.7% and 1.4%. In contrast with a prior study that showed much lower actual percent UV-B output than the manufacturers reported, our measurements indicated fairly equivalent and constant percentages.

Our selection of salons and tanning devices in the prospective study, although adequate for a pilot study, limits a recommendation to wide implementation. These results, obtained in a small population under medical care, may not be reproduced by lamps or salons with different specifications. The prescribing physician who chooses this treatment must be aware of the risks inherent to sending patients to facilities with unknown dosimetry, intensity, and quality. It should be noted, however, that the medical record review, which found similar efficacy and adverse effects as the prospective study, used methodology that closely mimics real-life decision making; patients were asked to select Wolff tanning beds that had lamps similar to those that came with the original bed. All other variables, such as the particular salon, cleanliness, safety, lamp hours, and lamp type, were dependent on the patient’s selection. Until re-TUVB can be tested in conditions similar to real life, this treatment should be reserved for areas that do not have the option of prescription phototherapy and to salons with well-trained technicians and good equipment. Furthermore, these excellent results do not equate to support of the commercial tanning bed industry for generalized use or for use for a particular “medical” condition without physician’s guidance.

In conclusion, while there are limitations inherent to the retrospective and prospective studies, our results indicate that re-TUVB is a viable treatment for psoriasis. This treatment is particularly applicable in settings in which PUVA or UV-B is unavailable owing to geographic, cost, or other limitations. By combining acitretin therapy with commercial tanning, patients may enjoy an available, efficacious, and cost-effective treatment of their psoriasis with an acceptable adverse effect profile.

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A course on humanitarian assistance for dermatologists, intended to prepare dermatologists for participation in humanitarian assistance projects under austere circumstances, will be offered in Bethesda, Md, from June 2 through June 6, 2003. The primary audience is federal dermatologists and residents, but the course is open to civilan dermatologists and residents with interest or experience in humanitarian assistance. The course is ideal for people who might volunteer to work with organizations that provide medical or humanitarian assistance and disaster relief. The course is offered under the auspices of the Department of Dermatology, Uniformed Services University of the Health Sciences, and the Center for Disaster and Humanitarian Assistance Medicine. Up to 30 hours of AAD/AMA Level I CME will be awarded. The course has a limited enrollment. For more information, contact the course director, Scott A. Norton, MD, MPH, Dermatology Service, Walter Reed Army Medical Center, Washington, DC 20307; phone: (202) 782-9484; fax: (202) 782-9118; e-mail: scott.norton@na.amedd.army.mil.

REFERENCES