Clinical Policy Bulletin:
Grenz Ray Therapy for Skin Disorders

Number: 0231

Policy

Aetna considers Grenz ray therapy experimental and investigational for the treatment of dermatologic conditions because there is inadequate evidence in the published peer-reviewed medical literature regarding the effectiveness of Grenz ray therapy in the treatment of skin disorders.

Background

Grenz rays describe x-rays with of long wavelength and low energy which possess limited penetration (so-called "soft" x-rays, their energy is between that of conventional roentgen rays and ultraviolet light). They are almost entirely absorbed in the first 2 mm of skin where they are exert their predominant effect by reducing the number of dendritic lymphocytes (Langerhans cells) within the epidermis. Therefore, Grenz ray therapy has been investigated for a variety of inflammatory skin disorders, including allergic contact dermatitis, atopic dermatitis, psoriasis, lichen planus, seborrheic dermatitis, herpes simplex, keratosis follicularis, Hailey and Hailey disease, hemangioma, nevus flammeus, lentigo maligna, Bowen's disease, patch stage mycosis fungoides, mycobacterium granuloma, leishmaniasis, granuloma annulare, pruritis ani et vulvae, lichen simplex chronicus, dyshidrosis, and persistent eczematous conditions. Typical doses involve 200 rads (R) per session at weekly intervals for a total of 800 to 1,000 R. Treatment can be resumed after a 6-month rest, up to a total cumulative dose of 5,000 R (Edwards and Edwards, 1990).

This type of mild radiation therapy was most popular in the 1940s and many dermatologists had Grenz ray units in their offices. A 1973 survey estimated that approximately 55 % of dermatologic offices in the United States and Canada were equipped with Grenz ray units, and that 44 % of dermatologist used Grenz rays (Lindelof and Eklund, 1986). However, physicians became more reluctant to use Grenz rays, due to concern about the side effects of radiation therapy in general, the availability of psoralens and ultraviolet A light (PUVA) therapy, and the development of effective topical and systemic drugs. Recently there has been a resurgence of interest in this therapy. In particular Edwards and Edwards advocated their use in disease with prominent inflammatory components; with this strategy they stated that they can decrease the use of parenteral steroids by 90 % (Edwards and Edwards, 1990).

While Grenz rays are reported as safe, they are nonetheless x-rays and thus be treated with the same amount of caution as with other ionizing radiation. There is continuing concern about the potential cancer risk in any patient treated with ionizing radiation, particularly when other treatment options exist. Dabski and Stoll (1986) reported a case of a woman with psoriasis who developed 5 squamous
carcinomas at the site of Grenz ray treatment within a 7-year period following a 16-year period of repeated Grenz ray exposure. The total Grenz ray exposure was estimated at 3,000 R. Mortensen and Kjeldsen (1987) also reported on 5 patients who developed either squamous or basal cell carcinomas after exposure to 10,00 to 29,300 R of Grenz ray therapy. In a study based on a Swedish cancer registry, no increased risk of skin malignancies could be found among 14,140 patients who had been exposed to Grenz rays. There was no incidence of melanoma in among the treated patients. Only 8 patients developed other malignant skin lesions and 6 of these had been exposed to other carcinogens. The authors concluded that if there was any risk of skin malignancies, it would be very small (Lindelof and Eklund, 1986).

There is minimal information in the published literature regarding the clinical effect of Grenz ray therapy, and its niche in the hierarchy of dermatologic treatments. Clinical articles primarily appear in the Swedish literature. In a double-blind clinical trial Lendelof and Beitzner (1990) treated 15 patients with pustulosis palmoplantaris. One side of the body was treated with Grenz rays, while the other half served as a sham control. Thus patients served as their own controls. The results were analyzed based on a subjective visual assessment of the lesions by physicians, and a subjective assessment of itching by the patient. Although Grenz rays produced a significantly better response, the therapeutic benefit was minimal. No lesion healed completely.

Lindelof and Langerholm (1985) reported on 6 patients who had allergic contact dermatitis to nickel; the use of Grenz rays eliminated the allergic response as evidenced by a negative patch test. In another study of various applications of the technology, Lindelof (1987) reported that Grenz rays appeared to have no effect on the incidence of chemical irritation.

Lindelof (1987) also reported on 16 patients with psoriasis who were treated with Grenz ray therapy to the scalp. All patients improved and 14 of the 16 patients healed completely. However, only 3 patients remained healed 6 months after treatment. In a separate double-blind study of 17 patients, Lindelof reported that the combination of Grenz ray therapy and topical steroids was associated with a faster healing of lesions compared to topical steroids alone, although the exact number of days is not given (Johannesson and Lindelof, 1987). The combination therapy also showed a longer remission period compared to topical steroids alone.

The above studies are inadequate to validate this form of therapy. No patient selection criteria are given, and the role of Grenz ray therapy in relation to other treatment options is not elucidated.

In a Cochrane review, Marsland et al (2006) stated that many different interventions including Grenz ray therapy were reported to produce "improvement" in chronic palmoplantar pustulosis (PPP). However, there is no standardized method for evaluating response to treatment, and reductions in pustule counts or other empirical semi-quantitative scoring systems may be of little relevance to the patient. These authors noted that the ideal treatment for PPP remains elusive and that the standards of study design and reporting need to be improved to inform patients and those treating them of the relative merits of the many treatments available to them.

The National Institute for Health and Clinical Excellence's assessment on Grenz rays therapy for inflammatory skin conditions (2007) stated that "[c]urrent evidence on the efficacy of Grenz rays therapy for inflammatory skin conditions is very limited and is difficult to assess since reported patient groups are heterogeneous and patient numbers are small. With regard to safety, there is some concern about the risk of skin malignancy in the long term. Therefore, clinicians wishing to use Grenz rays therapy should do so only in research involving controlled trials, closely observed case series and/or contribution to a register. Studies should include clear definitions of treatment indications and quality of life measures."

In a review on non-standard and off-label therapies for psoriasis, Halverstam and Lebwohl (2008) stated that drugs that may be used as alternatives to standard therapies include mycophenolate mofetil, tacrolimus or pimecrolimus, isotretinoin, colchicine, sulfasalazine, paclitaxel, dapsone, azathioprine, and hydroxyurea. Other unconventional therapies include climatotherapy at the Dead
Sea and grenz ray therapy.

Using cross-sectional survey by mailed questionnaire, Schalock and colleagues (2008) reported the patterns of use of Grenz ray therapy (GRT) at their center over a 10-year period and evaluated the effectiveness of GRT in treating recalcitrant skin conditions. In addition, they evaluated patient perceptions about GRT, and if patients felt this form of treatment was worthwhile. Of 351 patients treated with GRT from 1990 to 2001, 98 (28 %) returned the questionnaire; 64 % reported decreased severity or clearing of disease (p = 0.003), and 63 % reported decreased or no discomfort (p = 0.006) 3 months following treatment. Overall, 54 % said GRT was worthwhile, and 53 % would choose it again; 40 % reported mild side effects. Number of treatments (p = 0.2) or total dose (p = 0.25) were not significantly different among responders to GRT and non-responders to GRT. In a subgroup of treated patients with a diagnosis of contact dermatitis (94 % with hand dermatitis), 64 % felt GRT was worthwhile and 77 % indicated that they would choose this therapy again if needed. The authors concluded that many patients treated with GRT for recalcitrant dermatitis reported that this treatment was an effective therapy in decreasing the discomfort and severity of their skin condition. Overall, just more than 50 % of treated patients believed GRT was a worthwhile therapy that they would use again. The major drawback of this study was the low return rate of the survey (28 %), which could have skewed these findings. It is possible that patients who did not find GRT effectively are less likely to return the survey.

An UpToDate review on “Palmoplantar pustulosis: Treatment” (Brunasso and Massone, 2016) stated that “Other interventions have been reported to be useful for PPP, including other topical and systemic drugs, tonsillectomy, a gluten-free diet in patients with associated gluten intolerance, and light-based or radiation therapy. Data on most of these therapies are limited …. Grenz ray therapy -- A six-week trial in which 17 patients with PPP were randomly assigned to treatment of PPP on one side of the body with Grenz ray therapy and a sham treatment on the contralateral side found greater improvement in PPP on the side of the body exposed to Grenz rays. However, the response was moderate and no patients achieved disease clearance”.

In summary, Grenz ray therapy (borderline or ultrasoft x-ray) is a form of ionizing radiation. It has been proposed as a treatment option for benign dermatoses that have been unresponsive to conventional therapy; however, this approach remains controversial in peer-reviewed medical literature. In fact, published observations on radiation-induced skin tumors and other neoplasms indicate that radiation therapy is contraindicated for benign cutaneous lesions, especially for dermatoses of the head and neck.

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<tr>
<th>CPT Codes / HCPCS Codes / ICD-10 Codes</th>
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<tr>
<td>Information in the [brackets] below has been added for clarification purposes. Codes requiring a 7th character are represented by &quot;+&quot;:</td>
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<tr>
<td>ICD-10 codes will become effective as of October 1, 2015:</td>
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<tr>
<td>CPT codes not covered for indications listed in the CPB [inappropriate for Grenz Ray therapy - unlisted code 77499 required]:</td>
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<tr>
<td>77401 Radiation treatment delivery, superficial and/or ortho voltage, per day</td>
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<td>96900 Actinotherapy (ultraviolet light)</td>
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<td>ICD-10 codes not covered for indications listed in the CPB (not all-inclusive):</td>
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<tr>
<td>A00.0 - B99.9 Infectious and parasitic diseases</td>
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<tr>
<td>C00.0 - D49.9 Neoplasms</td>
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The above policy is based on the following references:

8. Johannesson A, Lindelof B. Additional effect of Grenz rays on psoriasis lesions of the scalp
AETNA BETTER HEALTH® OF PENNSYLVANIA

Amendment to
Aetna Clinical Policy Bulletin Number: 0231 Grenz Ray Therapy for
Skin Disorders

There are no amendments for Medicaid.

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