

## Blinding techniques for laser therapy

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### **Blinding techniques in randomized controlled trials of laser therapy: an overview and possible solution.**

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Low-level laser therapy has evidence accumulating about its effectiveness in a variety of medical conditions. We reviewed 51 double blind randomized controlled trials (RCTs) of laser treatment. Analysis revealed 58% of trials showed benefit of laser over placebo. However, less than 5% of the trials had addressed beam disguise or allocation concealment in the laser machines used. Many of the trials used blinding methods that rely on staff cooperation and are therefore open to interference or bias. This indicates significant deficiencies in laser trial methodology. We report the development and preliminary testing of a novel laser machine that can blind both patient and operator to treatment allocation without staff participation. The new laser machine combines sealed preset and non-bypassable randomization codes, decoy lights and sound, and a conical perspex tip to overcome laser diode glow detection.

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### **The use of low-level light for hair growth: part I.**

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**BACKGROUND AND OBJECTIVE:** Low-level laser therapy (LLLT) is a new therapy for the treatment of hair loss. It has received enormous media attention and tremendous marketing budgets from companies that sell the devices, but no independent, peer-reviewed studies have demonstrated its efficacy in this application. Here we investigate the efficacy of LLLT in enhancing hair growth. **METHODS:** A total of seven patients

were exposed to LLLT twice weekly for 20 minutes each time over a period of 3-6 months. Five patients were treated for a total of 3 months and two were treated for 6 months. Videomicroscopic images were taken at baseline, 3 months, and 6 months, and analyzed for changes in vellus hair counts, terminal hair counts, and shaft diameter. Both videomicroscopic and global images underwent blinded review for evidence of subjective improvement. Patients also answered questionnaires assessing hair growth throughout the study. Neither patients nor physicians conducting the study received any financial compensation. **RESULTS:** The results indicate that on average patients had a decrease in the number of vellus hairs, an increase in the number of terminal hairs, and an increase in shaft diameter. However, paired t-testing indicated that none of these changes was statistically significant. Also, blinded evaluation of global images did not support an improvement in hair density or caliber. **CONCLUSIONS:** LLLT may be a promising treatment option for patients who do not respond to either finasteride or minoxidil, and who do not want to undergo hair transplantation. This technology appears to work better for some people than for others. Factors predicting who will most benefit are yet to be determined. Larger, longer-term placebo-controlled studies are needed to confirm these findings, and demonstrate statistical significance, or refute them altogether.

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**HairMax LaserComb(R) Laser Phototherapy Device in the Treatment of Male Androgenetic Alopecia: A Randomized, Double-Blind, Sham Device-Controlled, Multicentre Trial.**

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The use of low levels of visible or near infrared light for reducing pain, inflammation and oedema, promoting healing of wounds, deeper tissue and nerves, and preventing tissue damage has been known for almost 40 years since the invention of lasers. The HairMax LaserComb(R) is a hand-held Class 3R lower level laser therapy device that contains a single laser module that emulates 9 beams at a wavelength of 655 nm (+/-5%). The device uses a technique of parting the user's hair by combs that are attached to the device. This improves delivery of distributed laser light to the scalp. The combs are designed so that each of the teeth on the combs aligns with a laser beam. By aligning the teeth with the laser beams, the hair can be parted and the laser energy delivered to the scalp of the user without obstruction by the individual hairs on the scalp. The primary aim of the study was to assess the safety and effectiveness of the HairMax LaserComb(R) laser phototherapy device in the promotion of hair growth and in the cessation of hair loss in males diagnosed with androgenetic alopecia (AGA). This double-blind, sham device-controlled, multicentre, 26-week trial randomized male patients with Norwood-Hamilton classes IIa-V AGA to treatment with the HairMax LaserComb(R) or the sham device (2 : 1). The sham device used in the study was identical to the active device except that the laser light was replaced by a non-active incandescent light source. Of the 110 patients who completed the study, subjects in the HairMax LaserComb(R) treatment group exhibited a significantly greater increase in mean terminal hair density than subjects in the sham device group ( $p < 0.0001$ ). Consistent with this evidence for primary

effectiveness, significant improvements in overall hair regrowth were demonstrated in terms of patients' subjective assessment ( $p < 0.015$ ) at 26 weeks over baseline. The HairMax LaserComb(R) was well tolerated with no serious adverse events reported and no statistical difference in adverse effects between the study groups. The results of this study suggest that the HairMax LaserComb(R) is an effective, well tolerated and safe laser phototherapy device for the treatment of AGA in males.

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## **Current and future trends in home laser devices.**

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Laser and intense pulse light procedures, once limited to physician offices and operating rooms, have become increasingly available at a variety of nonmedical sites such as spas. State regulations as to whom can perform these treatments varies greatly across the United States and, thus, in some states, the operators of these devices do not have any significant additional medical or laser knowledge more so than the patients who receive treatment. Although serious complications of laser treatments occur, they are rare when the procedure is performed correctly. Currently, there are 2 light devices approved by the Food and Drug Administration for home hair removal on the U.S. market, and several other companies are expected to release products in the near future. There are two home laser devices marketed for hair loss. As these light-based devices become smaller, safer, easier to use, as well as cheaper to manufacture, direct use by patients will increase. Results from home use devices are impressive but still inferior to office-based lasers and light devices. It is likely that home lasers and intense pulsed light devices will eventually receive other indications because many of these devices use wavelengths similar to currently available office based equipment.

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### **Understanding and management of female pattern alopecia.**

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Female pattern hair loss is devastating to many of the 21 million U.S. women who suffer from it. It is essential to differentiate female pattern hair loss from other types of hair loss to ensure appropriate treatment. Through use of follicular units, follicular families, and follicular pairing between existing hair follicles, natural-looking results can be achieved in women. Hair transplants create the benefit of increasing density and

providing options for hair styling and can be combined with medications, devices, and styling aids such as minoxidil, low-level laser therapy, and topical powder makeup, respectively.

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## **Use of the pulsed infrared diode laser (904 nm) in the treatment of alopecia areata.**

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**BACKGROUND:** Alopecia areata is a rapid and complete loss of hair in one or several patches, usually on the scalp, affecting both males and females equally. It is thought to be an autoimmune disease which is treated with different modalities with variable success. Laser treatment of different wavelengths has been used in the management of this problem. **OBJECTIVE:** To study the effect of the pulsed infrared diode laser (904 nm) in the treatment of alopecia areata. **Methods.** Sixteen patients with 34 resistant patches that had not responded to different treatment modalities for alopecia areata were enrolled in this study. In patients with multiple patches, one patch was left as a control for comparison. Patients were treated on a four-session basis, once a week, with a pulsed diode laser (904 nm) at a pulse rate of 40/s. A photograph was taken of each patient before and after treatment. **RESULTS:** The treated patients were 11 males (68.75%) and five females (31.25%). Their ages ranged between 4 and 50 years with a mean of 26.6+/-SD of +/-13.8, and the durations of their disease were between 12 months and 6 years with a mean of 13.43+/-SD of +/-18.34. Regrowth of hair was observed in 32 patches (94%), while only two patches (6%) failed to show any response. No regrowth of hair was observed in the control patches. The regrowth of hair appeared as terminal hair with its original color in 29 patches (90.6%), while three patches (9.4%) appeared as a white villous hair. In patients who showed response, the response was detected as early as 1 week after the first session in 24 patches (75%), while eight patients (25%) started to show response from the second session. **CONCLUSION:** The pulsed infrared diode laser is an effective mode of therapy with a high success rate for resistant patches of alopecia areata.

## **THE LOW INTENSIVE LASER THERAPY OF ALOPECIA**

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Recently a great deal of men and women suffer from quantitative and qualitative disorders of hair growth of diverse etiology. Based on the property of low intensive laser radiation to activate substantially the microcirculation and to enhance metabolic and regulate neurohumoral processes, the author seeks to normalize by means of laser

circulation the functioning of hairy follicle and to reduce degeneration-dystrophic processes in derma which result in disorder of hair regeneration. Therapeutic laser apparatus with the wavelength of 0,63 and 0,89 mm were used for the treatment. A course of therapy consists of 10-15 procedures. Depending on a complication of the disease a patient underwent 1 to 3 courses with the intervals of 1, 3 and 6 months. 78 patients (17 men and 61 women) at the age of 16 to 49 years old have been treated. Diseases have been caused by strong stresses, after-effects of surgical treatment, ovary and thyroid gland dysfunctions, gastroenteric diseases etc. A considerable improvement of hair quality, recovery of pigment, increase in thickness and rate of hair growth (50-100%) were observed in all cases. An intensive alopecia was ceased among 100% of patients. By the end of the first course a daily number of fallen hairs was in accordance with the norm. By the end of the third week an appearance of new hairs was observed along the front line of growth in 90% of patients. Out of 24 patients underwent three medical treatments the problem was completely solved for 23 of them. The effectiveness of laser method in the treatment of alopecia is confirmed

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### **Linear polarized infrared irradiation using Super Lizer is an effective treatment for multiple-type alopecia areata.**

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**BACKGROUND:** Super Lizer trade mark is a linear polarized light instrument, which has been used with good effect in orthopedics and anesthesiology to treat arthralgia and neuralgia with a high output of infrared radiation. **AIM:** To test Super Lizer trade mark 's efficacy for the treatment of alopecia areata. **METHODS:** Fifteen patients over 18 years of age, diagnosed with alopecia areata and displaying symptoms of patchy hair loss, were topically irradiated with infrared radiation using the Super Lizer trade mark. The patients were irradiated intermittently for an interval of 3 min once every week or every 2 weeks. **RESULTS:** Seven of 15 (46.7%) of the irradiated areas showed hair regrowth 1.6 months earlier than the nonirradiated areas (chi<sup>2</sup> official approval, P = 0.003). With regard to adverse effects caused by Super Lizer trade mark treatment, only one patient complained of a sensation of heat in the irradiated area. **CONCLUSIONS:** These findings suggest that Super Lizer trade mark, with its noninvasive properties, is a useful apparatus for the treatment of mild forms of alopecia areata.