



The current role of laser/light sources in the treatment of male and female pattern hair loss

Authors: Marc R. Avram^a; Robert T. Leonard Jr^b; Edwin S. Epstein^c; Joseph L. Williams^d; Alan J. Bauman^e

Affiliations:

^a NY Presbyterian/Weill Cornell Medical Center, New York, NY, USA

^b Leonard Hair Transplant Associates, Cranston, RI, USA


^c Stuart Medical Group, Richmond, VA, USA

^d Advanced Medical Hair Institute, Las Vegas, NV, USA

^e Bauman Medical Group, Boca Raton, FL, USA

DOI: 10.1080/14764170601134479

Publication Frequency: 4 issues per year

Published in:  [Journal of Cosmetic and Laser Therapy](#), Volume [9](#), Issue [1](#) 2007, pages 27 - 28

Abstract

Over the past several years there has been great interest in the potential role of laser/light-based treatments for male and female pattern hair loss. Despite aggressive marketing and centers claiming great success in the treatment of hair loss there is little scientific data supporting laser/light sources in hair loss. This paper is a consensus of hair loss experts on the current scientific data, mechanisms of action, safety, protocols and recommendations regarding laser/light treatment for hair loss. The authors believe that, while seemingly safe, there are no controlled, peer-reviewed studies validating current devices for hair loss and that all patients should be medically evaluated for any hair loss by a physician specialist to rule out other underlying medical conditions or the etiology of hair loss.

Keywords: Alopecia; hair loss; laser; low-level laser therapy; medical treatment

Introduction

Each year, millions of men and women seek medical therapy to treat their male and female pattern hair loss. There are currently two FDA-approved medications for male pattern hair loss: minoxidil and finasteride [3](#). For women, there is one: minoxidil. While safe and effective, the vast majority of patients never use either of these medications. There is a variety of reasons including misinformation, unrealistic expectations, and side effects. As a result, there is a plethora of different supplements, creams, diets and, more recently, laser/light sources available to patients which purport to stop and/or regrow lost hair [4-9](#).

Laser/light sources have become increasingly popular over the past few years in both medical and non-medical settings. Photobiomodulation is the commonly used term to describe the effect of lower-level light energy on the cellular level. There are devices sold directly to patients for home use and others to salons, spas, hair replacement studios, and physician offices. The cost of recommended treatment protocols varies from hundreds to thousands of dollars over 6-12 months.

The focus of this paper is to review, from the experiences of the authors of this paper, the currently proposed mechanisms of action, treatment protocols, safety, peer-reviewed scientific published studies, and recommended role for laser/light sources to stop and/or regain lost hair. The mechanism of action by which photobiomodulation stops or reverses male or female pattern hair loss is unknown. Multiple theories exist to explain the observed changes which occur on a cellular level in response to low-level laser therapy [10-13](#). One theory suggests an increased blood flow at the dermal papilla as a possible mechanism of action. Clinical examples of photo-induced hair growth include the paradoxical growth of hair that occurs in a small percentage of patients undergoing laser hair removal and PUVA to treat alopecia totalis [14-18](#). Treatment protocols include 15 to 30-minute treatments on alternating days for 2-4 weeks, tapering to one to two treatments per week for 6-12 months, followed by bi-weekly and once per month maintenance treatments.

There have been no peer-reviewed blinded studies published on hair loss/hair growth. Therefore, the success or lack of success of laser/light sources to treat hair loss is unknown. There is a consensus among the authors of this paper that current laser/light devices are safe if used properly. The majority also believe there has been a positive impact in the majority of their patients with male and female pattern hair loss as a stand-alone or adjunctive therapy. Most report a change in the texture and quality of hair in patients even if there is no regrowth. All believe maintenance treatments are necessary after the initial 6-12-month treatment protocol. The majority of authors believe there is a reduced risk of post-surgical telogen effluvium and an earlier regrowth of transplanted hair in patients that used laser/light sources during the pre- and post-surgical period.

The authors believe that all patients need to be evaluated by a physician who specializes in all aspects of hair loss from medical therapy to hair restoration surgery and to discuss treatment options and formulate an appropriate treatment plan. There are numerous etiologies for hair loss. It is therefore the unanimous consensus of the authors that treatment of hair loss by low-level laser/light therapy should be performed only in a medical setting and not by lay persons in a non-medical facility. Before beginning any therapy for hair loss, a history, physical exam and, in some cases, a blood test or a scalp biopsy are needed to establish the correct etiology. A delay in an appropriate medical workup can result in an unnecessary permanent loss of hair.

Laser/light sources appear to be safe and effective in the treatment of male and female pattern hair loss. Currently, the evidence remains anecdotal and relatively non-scientific. Well-designed studies are needed so physicians can more accurately counsel patients regarding the efficacy, long-term benefit and downside of laser/light sources in the treatment of hair loss.

References

- 1. Price, V. H., Menefee, E., Sanchez, M. and Kaufman, K. D. (2006) Changes in hair weight in men with androgenetic alopecia after treatment with finasteride (1 mg daily): Three- and 4-year results.. *J Am Acad Dermatol* **55** , pp. 71-74. - Epub 2006 May 3 [\[crossref\]](#)
- 2. Stough, D., Stenn, K., Haber, R., Parsley, W. M., Vogel, J. E. and Whiting, D. A. (2006) Psychological effect, pathophysiology, and management of androgenetic alopecia in men.. *Mayo Clin Proc* **81** , p. 267. - author reply 267-8
- 3. Olsen, E. A., Messenger, A. G., Shapiro, J., Bergfeld, W. F., Hordinsky, M. K. and Roberts, J. L. (2005) Evaluation and treatment of male and female pattern hair loss.. *J Am Acad Dermatol* **53** , pp. 365-368. [\[crossref\]](#)
- 4. Gundogan, C., Greve, B. and Raulin, C. (2004) Treatment of alopecia areata with the 308-nm xenon chloride excimer laser: Case report of two successful treatments with the excimer laser.. *Lasers Surg Med* **34** , pp. 86-90. [\[crossref\]](#)
- 5. Satino, J. L. and Markou, M. (2003) Hair regrowth and increased hair tensile strength using the HairMax LaserComb for low-level laser therapy.. *Int J Cosmet Surg Aesthet Dermatol* **5** , pp. 113-117.
- 6. Weiss, R., McDaniel, D. H., Geronemus, R. G. and Weiss, M. LED photomodulation induced hair growth stimulation.. American Society for Laser Medicine and Surgery, ASLMS Annual Meeting, Orlando, FL, USA
- 7. Pontinen, P. J., Aaltokallio, T. and Kolari, P. J. (1996) Comparative effects of exposure to different light sources (He-Ne laser, InGaAl diode laser, a specific type of noncoherent LED) on skin blood flow for the head.. *Acupunct Electrother Res* **21** , pp. 105-118.
- 8. Kessels, A. G., Cardynaals, R. L., Borger, R. L., Go, M. J., Lambers, J. C. and Knottnerus, J. A. (1991) The effectiveness of the hair-restorer 'Dabao' in males with alopecia androgenetica. A clinical experiment.. *J Clin Epidemiol* **44**:(4-5) , pp. 439-447. [\[crossref\]](#)
- 9. Kligman, A. M. and Freeman, B. (1988) History of baldness. From magic to medicine.. *Clin Dermatol* **6** , pp. 83-88. [\[crossref\]](#)
- 10. Karu, T. I., Pyatibrat, L. V. and Afanasyeva, N. I. (2005) Cellular effects of low power laser therapy can be mediated by nitric oxide.. *Lasers Surg Med* **36** , pp. 307-314. [\[crossref\]](#)
- 11. Karu, T. (1998) *The science of low power laser therapy* Gordon and Breach Science Publishers
- 12. Tuner, J. and Hode, L. (2002) *Laser therapy clinical practice and scientific background* Prima Books
- 13. Pontinen, P. J. (1992) *Low level laser therapy as a medical treatment modality* Prima Books/Art Urpo Ltd
- 14. Bouzari, N. and Firooz, A. R. (2006) Lasers may induce terminal hair growth.. *Dermatol Surg* **32** , p. 460. - [Comment on: *Dermatol Surg*. 2005;31:584-6.]
- 15. Kontoes, P., Vlachos, S., Konstantinos, M., Anastasia, L. and Myrto, S. (2006) Hair induction after laser-assisted hair removal and its treatment.. *J Am Acad Dermatol* **54** , pp. 64-67. - Epub 2005 Dec 2 [\[crossref\]](#)
- 16. Alajlan, A., Shapiro, J., Rivers, J. K., MacDonald, N., Wiggan, J. and Lui, H. (2005) Paradoxical hypertrichosis after laser epilation.. *J Am Acad Dermatol* **53** , pp. 85-88. [\[crossref\]](#)
- 17. Bernstein, E. F. (2005) Hair growth induced by diode laser treatment.. *Dermatol Surg* **31** , pp. 584-586.
- 18. Yamazaki, M., Miura, Y., Tsuboi, R. and Ogawa, H. (2003) Linear polarized infrared irradiation using Super Lizer is an effective treatment for multiple-type alopecia areata.. *Int J Dermatol* **42** , pp. 738-740. [\[crossref\]](#)
- 19. Waiz, M., Saleh, A. Z., Hayani, R. and Jubory, S. O. (2006) [Use of the pulsed infrared diode laser \(904 nm\) in the treatment of alopecia areata.. *J Cosmet Laser Ther* **8** , pp. 27-30. \[\\[informaworld\\]\]\(#\)](#)