Dose Matters: Why Higher-Fluence LaserCap® Delivers Superior Hair Regrowth

Scientific Rationale

Low-level laser therapy (LLLT) has been FDA-cleared for androgenetic alopecia (AGA) since 2007. Hair follicles respond to photobiomodulation in a dose-dependent manner, meaning insufficient energy delivery predictably limits clinical efficacy.

Clinical Evidence: High Dose Outperforms Low Dose

A double-blinded, randomized, sham-controlled clinical trial in treatment-naïve AGA patients compared LaserCap SD (1.15 J/cm²) and LaserCap HD+ (3.93 J/cm²) against sham using objective phototrichogram measurements. Both active devices improved hair count versus sham, but HD+ demonstrated the greatest improvement and was the only treatment independently associated with statistically significant hair growth. HD+ uniquely increased thin and normal terminal hairs, the most cosmetically meaningful endpoints; see Appendix A.

Optical Reality: What Devices Actually Deliver

Optical power testing using calibrated Thorlabs photodetectors measured actual delivered fluence across leading photobiomodulation devices. LaserCap HD+ delivered approximately 3.9 J/cm², LaserCap SD delivered approximately 1.18 J/cm², while all major competitor devices operated below the SD dose range (~0.23–1.15 J/cm²); see App. B & C.

Scientific Synthesis

Clinical evidence confirms superior hair regrowth with higher delivered fluence. Optical measurements demonstrate that most competing devices deliver sub-therapeutic energy levels, making reduced efficacy predictable based on established photobiological principles.

Why LaserCap®

- Highest delivered energy supported by controlled human clinical data
- FDA-cleared photobiomodulation technology
- Industry-best warranty reflecting engineering confidence
- Top-rated customer service
- In continuous operation since 2009

Bottom Line

Hair regrowth with photobiomodulation is not simply about using light—it is about delivering enough of the right light. LaserCap HD+ aligns optical physics with biological response to deliver clinically validated, high-fluence treatment superiority.

Effect of Increasing Fluence of Low-Level Laser Therapy for Treatment of Androgenetic Alopecia - a Double-Blinded Randomized Sham-Controlled Trial

Low-level laser therapy (LLLT), FDA-cleared since 2007 for the treatment of androgenetic alopecia (AGA), delivers ~650 nm light to stimulate follicular mitochondria and promote hair growth. Although higher fluences may increase treatment response, randomized controlled trials comparing devices of differing fluence are limited. Furthermore, existing clinical trials include patients on confounding therapies, obfuscating conclusions regarding the efficacy of LLLT
In this double-blinded trial, a total of 48 patients with treatment-naïve AGA were randomly assigned in a 1:2:2 ratio to sham LaserCap:LaserCap SD (1.15 J/cm²):LaserCap HD+ (3.93 J/cm²). The study was designed to validate the use of LLLT in a sham-controlled setting and to evaluate the efficacy increasing fluence via phototrichogram.

Both active devices significantly increased total hair count compared with sham (HD+ 18.39 hairs/cm 2 ,p=0.0053; SD 13.95 hairs/cm 2 ,p=0.0150). On multiple linear regression, treatment with HD+ was the only factor associated with a significant improvement in total hair count (p=0.0508). HD+ also led to significant increases in thin hairs (p=0.0187) and normal hairs (p=0.0234), while vellus hairs increased with both HD+ and SD (HD+ p=0.0153; SD p=0.0329). Subgroup analyses revealed sex-specific effects: males demonstrated significant increases in thin terminal hairs with HD+ versus sham (p=0.0437), whereas females showed significant increases in vellus hairs with HD+ versus sham (p=0.0100).

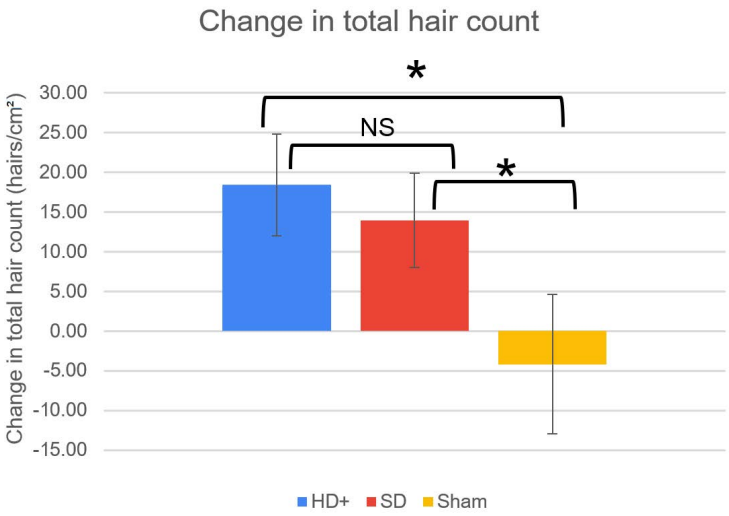
These results support the efficacy of LLLT in promoting hair growth in AGA, and suggest a dose-dependent effect with higher fluences. The observed sex-specific patterns suggest that treatment response may vary between males and females, offering insight into personalized approaches for managing AGA.

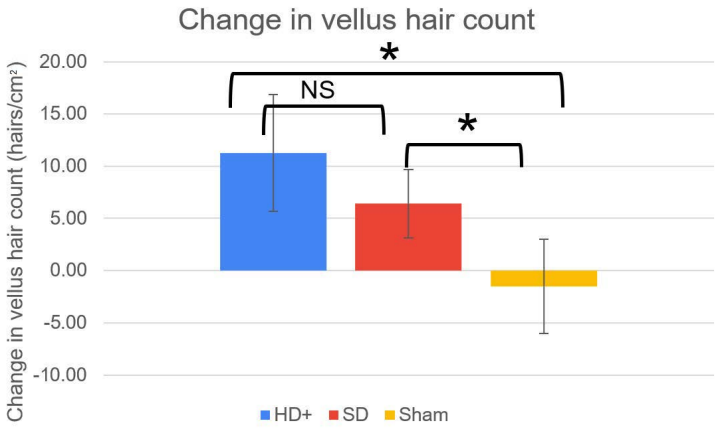
ClinicalTrials.gov ID NCT05365360
Sponsor University of Arizona
Information provided by University of Arizona (Responsible Party)
https://clinicaltrials.gov/study/NCT05365360

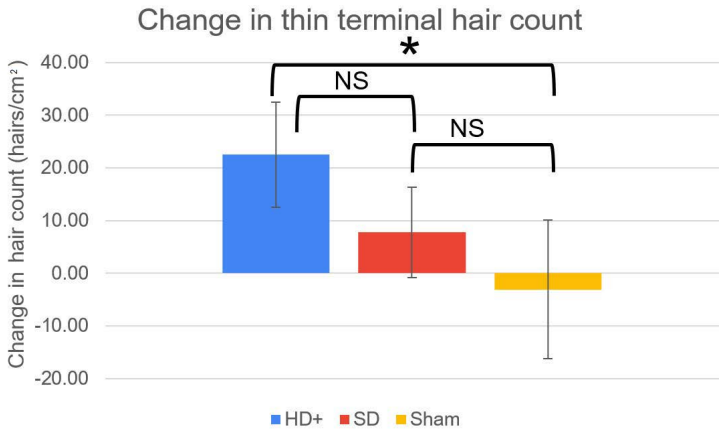
All Clinical and Sham Devices provided by LaserCap Company

The above Abstract has been submitted to the American Academy of Dermatology for their 2026 Annual Meeting demonstrating the effectiveness of LaserCap's high-powered photobiomodulation treatment for hair regrowth; presented here in advance at the International Society of Hair Restoration Surgery 33rd World Congress, this October 23-26, 2025, at the InterContinental Berlin Hotel, Berlin, Germany.

2025-10-17 Michael Rabin, MD, MBA, CEO mrabin@lasercap.com







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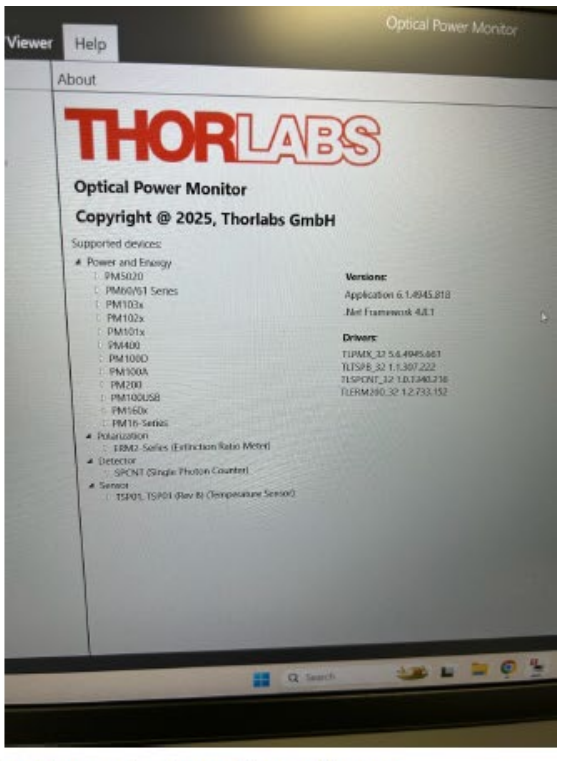
APPENDIX B: Measured Optical Powers and Calculated Fluences (Power x Time) for the listed photobiomodulation devices for hair regrowth All measurements performed with calibrated Thorlabs equipment by Michael Rabin, MD ; 2025-12-19; mrabin@lasercap.com

model	energy	diode	coverage	peak mW	avg mW	duty	pulse/	rx time	light	wave
	per cm2 (J)	count	cm2	per diode	per diode	cycle	sec (Hz)	(min)	type	length
lasercaphdplus	**3.92**	304	600	8.6	4.3	50%	6	30	laser	650
lasercaphd	**3.30**	224	525	8.6	4.3	50%	6	30	laser	650
lasercapsd	**1.18**	80	525	8.6	4.3	50%	6	30	laser	650
kierr 272md	**1.15**	272	550	3.7	1.9	50%	6	21	laser	650
theradome lh80	**1.13**	80	500	5.9	5.9	100%	1	20	laser	680
irestore elite wavelength1	0.39	150	550	2.0	2.0	100%	1	12	laser	655
irestore elite wavelength2	0.39	150	550	2.0	2.0	100%	1	12	laser	680
irestore elite wavelength3	0.26	200	550	1.0	1.0	100%	1	12	led	625
irestore elite total output	**1.05**	500	550	1.6	1.6	100%	1	12	laser+led	multiple
xtrallux extreme	**0.51**	352	550	2.2	2.2	100%	1	6	laser	650
revian red wavelength1	0.33	60	550	5.0	5.0	100%	1	10	led	620
revian red wavelength2	0.17	59	550	2.6	2.6	100%	1	10	led	660
revian red total output	**0.49**	119	550	3.8	3.8	100%	1	10	led	multiple
xtrallux turbo	**0.46**	316	550	2.2	2.2	100%	1	6	laser	650
capillus pro s1	**0.44**	304	550	2.2	2.2	100%	1	6	laser	650
capillus spectrum wavel1	0.39	272	550	2.2	2.2	100%	1	6	laser	650
capillus spectrum wavel2	0.05	40	550	1.8	1.8	100%	1	6	laser	808
capillus spectrum total	**0.44**	312	550	2.1	2.1	100%	1	6	laser	multiple
capillus ultra	**0.23**	82	500	3.9	3.9	100%	1	6	laser	650

device serial numbers at https://drive.google.com/drive/folders/13B00e6TB7l1b4t43McvCLDLas_sdXKJE?usp=sharing

calibrated thorlabs photodetector

calibrated thorlabs interface



thorlabs optical monitor software

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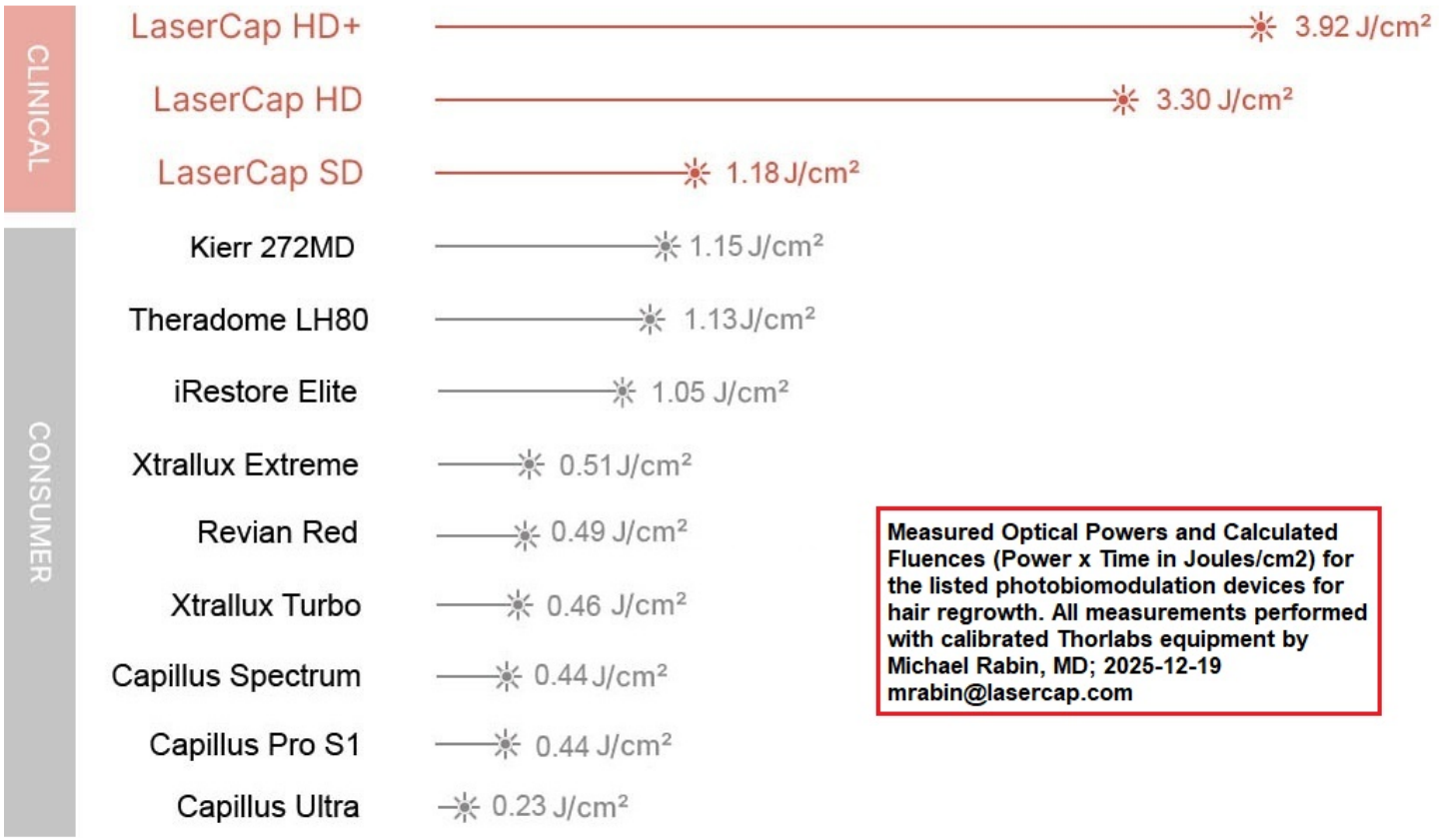
About LaserCap® Company - Transdermal Cap, Inc. was formed in 2006 by co-inventors Michael Rabin, MD and M.I.T. trained optical physicist Dave Smith, PhD, in collaboration with Harvard-based photomedicine expert Michael Hamblin, PhD and internationally acclaimed hair restoration physician Robert Haber, MD, to develop innovative light-based devices for the Global Beauty & Health Industries. Its first commercial product is the LaserCap for women and men with thinning hair or at risk for thinning hair, a condition that affects up to 50% of adult women and 80% of adult men. Patents pending,

APPENDIX C



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