

Light Therapy Clinical Studies;

Condition	Wavelength (nm)	time	Link to Study
Fat reduction			
Neira R, Arroyave J, Ramirez H, Ortiz CL, Solarte E, Sequeda F, and Gutierrez MI. Fat liquefaction: Effect of low-level laser energy on adipose tissue	635 nm	6 min irradiation time	https://www.ncbi.nlm.nih.gov/pubmed/12172159
Caruso-Davis MK, Guillot TS, Podichetty VK, Mashtalir N, Dhurandhar NV, Dubuisson O, et al. Efficacy of low-level laser therapy for body contouring and spot fat reduction	635–680 nm	30 min twice a week for 4 weeks	https://www.ncbi.nlm.nih.gov/pubmed/20393809
Cellulite reduction & body contouring			
Reduction in thigh circumference and improvement in the appearance of cellulite with dual-wavelength, low-level laser energy and massage. Michael H. Gold, Khalil A. Khatri, Kelley Hails, Robert A. Weiss & Nathalie Fournier	650 nm and 915 nm	83 subjects	https://www.ncbi.nlm.nih.gov/pubmed/21275531
Sasaki GH, Oberg K, Tucker B, and Gaston M. The effectiveness and safety of topical PhotoActiv phosphatidylcholine-based anti-cellulite gel and LED (red and near-infrared) light on Grade II-III thigh cellulite: a randomized, double-blinded study. J Cosmet Laser Ther, 2007; 9(2): 87–96.	660 nm and 950 nm	3 months. Twice weekly, each thigh was exposed for a 15-minute treatment with LED light for a total of 24 treatments	https://www.ncbi.nlm.nih.gov/pubmed/17558758
Weight Loss Studies			
Effects of Low-level Laser Therapy in Subcutaneous Fat Reduction and Improvement in Body Contour		658 6 treatments	https://vevazz.com/pdf/311%20paient%20study.pdf
Efficacy of Low Level Laser Therapy for Body Contouring and Spot Fat Reduction	635-680nm	8 treatments, 30 minutes twice a week for 4 week	https://vevazz.com/pdf/Double%20Blind%20Greenway%20Study.pdf

Fat Liquefaction: Effect of Low-Level Laser Energy on Adipose Tissue		635	1 treatment, 6 min	https://vevazz.com/pdf/Fat%20liquefaction%20LLLT%20study.pdf
A New Non-Invasive Approach for Body Contouring: the Applications of the Low-Level Laser Therapy			6 treatments, 40 min 3 times per week for 2 weeks	https://vevazz.com/pdf/American%20Academy%20of%20Anti%20aging%20Study.pdf
David Turok, MD	635nm		6 treatments, 40 min 3 times per week for 2 weeks	https://vevazz.com/pdf/Jackson%20Non-Invasive%20Approach%20for%20Body%20Contouring%20Randomized%20Controlled%20Study.pdf
Low-Level Laser Therapy as a Non-Invasive Approach for Body Contouring: A Randomized, Controlled Study	635 nm		8 treatments, 20 min each during 2 weeks	https://vevazz.com/pdf/Strawberry%20Laser%20inch%20Loss%20clinical%20study%202010.pdf
Strawberry Laser inch loss clinical study 2010	n/a			
Study of the Effect of Low Level Laser Light Therapy on Reducing the Appearance of Cellulite in the Thighs and Buttocks	532nm	n/a		https://clinicaltrials.gov/ct2/show/NCT01702259
Low-level laser therapy (LLLT) does not reduce subcutaneous adipose tissue by local adipocyte injury but rather by modulation of systemic lipid metabolism.	650nm		6 treatments 2-3 days apart	https://www.ncbi.nlm.nih.gov/pubmed/27384041
Efficacy of a multiple diode laser system for body contouring.	532nm		6 treatments, three times per week for 2 weeks	https://www.ncbi.nlm.nih.gov/pubmed/21384392

Miscellaneous

Eye Disease		670	8 treatments, twice a day, 250 s/per time for 4 d.	Photobiomodulation with 670 nm light increased phagocytosis in human retinal pigment epithelial cells. https://www.ncbi.nlm.nih.gov/pubmed/26321863
Thyrod		830	10 applications, twice a week for 5 weeks	Low-level laser therapy in chronic autoimmune thyroiditis: a pilot study https://www.ncbi.nlm.nih.gov/pubmed/20662037
Nerve Regeneration		660	21 treatments, 1 h per day for t 3 weeks	Effect of near-infrared light-emitting diodes on nerve regeneration. https://www.ncbi.nlm.nih.gov/pubmed/20358337
Hair Growth		655	60 treatments, every other day, 25 minute treatment	The growth of human scalp hair mediated by visible red light laser and LED sources in males. https://www.ncbi.nlm.nih.gov/pubmed/24078483

Hair Growth		60 treatments, every other day, 25 minute 656 treatment	The growth of human scalp hair in females using visible red light laser and LED sources. https://www.ncbi.nlm.nih.gov/pubmed/25124964
Traumatic Brain Injury		18 treatments, 3 times per week for 6 weeks, 9 min 45 sec each 633 application	Transcranial, Red/Near-Infrared Light-Emitting Diode Therapy to Improve Cognition in Chronic Traumatic Brain Injury. https://www.ncbi.nlm.nih.gov/pubmed/28001756
Cancer treatment side effects	n/a	n/a	The use of low-level light therapy in supportive care for patients with breast cancer: review of the literature. https://www.ncbi.nlm.nih.gov/pubmed/27539464 Effect of phototherapy (low-level laser therapy and light-emitting diode therapy) on exercise performance and markers of exercise recovery: a systematic review with meta-analysis.
Muscle performance and accelerate recovery	red and infrared	16 tests	https://www.ncbi.nlm.nih.gov/pubmed/24249354
Muscle performance and accelerate recovery	905, 975 and 640	3 weeks, 17 sites, 3, 10, 30, and 60 minutes	Photobiomodulation Therapy Improves Performance and Accelerates Recovery of High-Level Rugby Players in Field Test: A Randomized, Crossover, Double-Blind, Placebo-Controlled Clinical Study. https://www.ncbi.nlm.nih.gov/pubmed/27050245
Wound healing	470 and 629	5 treatments, 5 consecutive days, 10 min applications	Low level light therapy by LED of different wavelength induces angiogenesis and improves ischemic wound healing. https://www.ncbi.nlm.nih.gov/pubmed/25363448

Neuropathy

Role of low-level laser therapy in neurorehabilitation	670 nm	1 time 20 minutes	https://www.ncbi.nlm.nih.gov/pubmed/21172691
Photobiomodulation by laser therapy rescued auditory neuropathy induced by ouabain.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/27666974
The mechanistic basis for photobiomodulation therapy of neuropathic pain by near infrared laser light.	808 nm	1 time 120 seconds	https://www.ncbi.nlm.nih.gov/pubmed/28075022

A comparative study of red and blue light-emitting diodes and low-level laser in regeneration of the transected sciatic nerve after an end to end neurorrhaphy in rabbits. Photobiomodulation Triple Treatment in Peripheral Nerve Injury: Nerve and Muscle Response.	LLL (680 nm), red LED (650 nm), and blue LED (450 nm)	14 treatments one per day for 14 days	https://www.ncbi.nlm.nih.gov/pubmed/26415928
660 nm red light-enhanced bone marrow mesenchymal stem cell transplantation for hypoxic-ischemic brain damage treatment	n/a	n/a 7 treatments, 7 consecutive days 24 hours 660 per day	https://www.ncbi.nlm.nih.gov/pubmed/28001757 https://www.ncbi.nlm.nih.gov/pubmed/25206807
Regeneration of specific nerve cells in lesioned visual cortex of the human brain: an indirect evidence after constant stimulation with different spots of light. (656nm)	656, 525, 578 and 450	n/a	https://www.ncbi.nlm.nih.gov/pubmed/7629891
The effect of photobiomodulation on chemotherapy-induced peripheral neuropathy: A randomized, shamcontrolled clinical trial.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/27887804
Analysis of the variation in low-level laser energy density on the crushed sciatic nerves of rats: a morphological, quantitative, and morphometric study. (780nm)		780 n/a	https://www.ncbi.nlm.nih.gov/pubmed/28063018
Effect of photobiomodulation therapy (808 nm) in the control of neuropathic pain in mice		808 n/a	https://www.ncbi.nlm.nih.gov/pubmed/28283814
Effect of Laser Photobiomodulation with Gradual or Constant Doses in the Regeneration of Rats' Mental Nerve After Lesion by Compression. (808nm)		808 20 treatments	https://www.ncbi.nlm.nih.gov/pubmed/28358662
Light promotes regeneration and functional recovery and alters the immune response after spinal cord injury. (810nm)		810 n/a	https://www.ncbi.nlm.nih.gov/pubmed/15704098
Promotion of regenerative processes in injured peripheral nerve induced by low-level laser therapy. (901nm)		901 10 treatments	https://www.ncbi.nlm.nih.gov/pubmed/17508846

Neuropeptide expression and morphometric differences in crushed alveolar inferior nerve of rats: Effects of photobiomodulation. (904nm

904 11 treatments

<https://www.ncbi.nlm.nih.gov/pubmed/28314941>

Diabetic Studies

Effects of low-level light therapy on hepatic antioxidant defense in acute and chronic diabetic rats

670 18 treatments

<https://www.ncbi.nlm.nih.gov/pubmed/19202557>

Hair Studies

Novel Approach to Treating Androgenetic Alopecia in Females With Photobiomodulation (Low-Level Laser Therapy).

650 60 treatments

<https://www.ncbi.nlm.nih.gov/pubmed/28328705>

Sport Recovery and muscle performance

Photobiomodulation Therapy Improves Performance and Accelerates Recovery of High-Level Rugby Players in Field Test: A Randomized, Crossover, Double-Blind, Placebo-Controlled Clinical Study

905 nm, 875 nm, and 640 nm

3 weeks, 17 sites, 3, 10, 30, and 60 minutes

<https://www.ncbi.nlm.nih.gov/pubmed/27050245>

Using Pre-Exercise Photobiomodulation Therapy Combining Super-Pulsed Lasers and Light-Emitting Diodes to Improve Performance in Progressive Cardiopulmonary Exercise Tests.

906 nm, 875 nm, and 640 nm

17 sites

<https://www.ncbi.nlm.nih.gov/pubmed/26942660>

A new treatment protocol using photobiomodulation and muscle/bone/joint recovery techniques having a dramatic effect on a stroke patient's recovery: a new weapon for clinicians.

n/a

8 treatments, once per week for 1 hour

<https://www.ncbi.nlm.nih.gov/pubmed/22967677>

Thyroid

Assessment of the effects of low-level laser therapy on the thyroid vascularization of patients with autoimmune hypothyroidism by color Doppler ultrasound.

n/a

10 treatments

<https://www.ncbi.nlm.nih.gov/pubmed/23316383>

Effects of low-level laser therapy on the serum TGF- β 1 concentrations in individuals with autoimmune thyroiditis.	830 nm	10 treatments	https://www.ncbi.nlm.nih.gov/pubmed/25101534
Low-level laser in the treatment of patients with hypothyroidism induced by chronic autoimmune thyroiditis: a randomized, placebo-controlled clinical trial.	830 nm	10 treatments	https://www.ncbi.nlm.nih.gov/pubmed/22718472

Visual- Retinal

Mitochondrial signal transduction in accelerated wound and retinal healing by near-infrared light therapy. (This indicated more than just retinal and wound healing as it's an abstract of many studies)	630-1000 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/16120414
Photobiomodulation reduces drusen volume and improves visual acuity and contrast sensitivity in dry age-related macular degeneration.	590 nm, 670 nm, and 790 nm	3 weeks	https://www.ncbi.nlm.nih.gov/pubmed/27989012
Near-Infrared Photobiomodulation in Retinal Injury and Disease.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/26427443
Treatment of dry Age-related Macular Degeneration with Photobiomodulation	670nm	88 +/- 8 seconds.	http://lumithera.com/wp-content/uploads/2014/04/TORPA-Clinical-Study.pdf
Near-Infrared Photobiomodulation in Retinal Injury and Disease (abstract)	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/26427443
Neuroprotective Effects Against POCD by Photobiomodulation: Evidence from Assembly/Disassembly of the Cytoskeleton. been demonstrated in experimental models of macular degeneration, neurological, and cardiac conditions.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/26848276
670nm photobiomodulation as a novel protection against retinopathy of prematurity: evidence from oxygen induced retinopathy models.	670 nm	3 minutes a day	https://www.ncbi.nlm.nih.gov/pubmed/23951291

Parkinson's and Brain Studies

Photobiomodulation-induced changes in a monkey model of Parkinson's disease: changes in tyrosine hydroxylase cells and GDNF expression in the striatum.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/28299414
Shining light on the head: Photobiomodulation for brain disorders. (ABSTRACT)	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/27752476
Significant Improvement in Cognition in Mild to Moderately Severe Dementia Cases Treated with Transcranial Plus Intranasal Photobiomodulation: Case Series Report.	810 nm	12 weeks	https://www.ncbi.nlm.nih.gov/pubmed/28186867

Lungs

The chemokines secretion and the oxidative stress are targets of low-level laser therapy in allergic lung inflammation.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/27649282
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Cancer and Tumors

Laser Therapy Inhibits Tumor Growth in Mice by Promoting Immune Surveillance and Vessel Normalization. (abstract did not indicate what level laser therapy)	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/27475897
"Quantum Leap" in Photobiomodulation Therapy Ushers in a New Generation of Light-Based Treatments for Cancer and Other Complex Diseases: Perspective and Mini-Review. age-related macular degeneration, diabetic retinopathy, glaucoma, retinitis pigmentosa) and the central nervous system (e.g., Alzheimer's and Parkinson's disease).	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/26890728
Low-level light therapy potentiates NPe6-mediated photodynamic therapy in a human osteosarcoma cell line via increased ATP.	810nm and 652nm	2 hours	https://www.ncbi.nlm.nih.gov/pubmed/25462575
Exploring the effects of low-level laser therapy on fibroblasts and tumor cells following gamma radiation exposure.	infra red	24 hours	https://www.ncbi.nlm.nih.gov/pubmed/27322660

Low-level laser therapy/photobiomodulation in the management of side effects of chemoradiation therapy in head and neck cancer: part 2: proposed applications and treatment protocols.	633 and 685 nm or 780-830 nm	two to three times a week up to daily	https://www.ncbi.nlm.nih.gov/pubmed/26984249
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Heart

Arrest of progression of pre-induced abdominal aortic aneurysm in apolipoprotein E-deficient mice by low level laser phototherapy.	780 nm	4 weeks, 9 minutes	https://www.ncbi.nlm.nih.gov/pubmed/25409657
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Acne treatment

Aziz-Jalali MH, Tabaie SM, and Djavid GE. 2012. Comparison of red and infrared low-level laser therapy in the treatment of acne vulgaris. <i>Indian J Dermatol</i> , 57: 128–130.	630 and 890 nm	twice in a week for 12 sessions	https://www.ncbi.nlm.nih.gov/pubmed/22615511
Cunliffe WJ and Goulden V. 2000. Phototherapy and acne vulgaris. <i>Br J Dermatol</i> , 142: 855–856	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/10809839
Goldberg DJ and Russell BA. 2006. Combination blue (415 nm) and red (633 nm) LED phototherapy in the treatment of mild to severe acne vulgaris. <i>J Cosmet Laser Ther</i> , 8: 71–75.	415 nm and 633nm	20 min per session, 8 sessions, two per week 3 days apart	https://www.ncbi.nlm.nih.gov/pubmed/16766484
Lee SY, You CE, and Park MY. 2007b. Blue and red light combination LED phototherapy for acne vulgaris in patients with skin phototype IV. <i>Lasers Surg Med</i> , 39: 180–188.	415 nm and 633nm	twice a week for 4 weeks	https://www.ncbi.nlm.nih.gov/pubmed/17111415
Lloyd JR and Mirkov M. 2002. Selective photothermolysis of the sebaceous glands for acne treatment. <i>Lasers Surg Med</i> , 31: 115–120.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/12210595
Papageorgiou P, Katsambas A, and Chu A. 2000. Phototherapy with blue (415 nm) and red (660 nm) light in the treatment of acne vulgaris. <i>Br J Dermatol</i> , 142: 973–978.	415 nm and 633nm	daily for 15 min for 12 weeks	https://www.ncbi.nlm.nih.gov/pubmed/10809858
Railan D and Alster TS. 2008. Laser treatment of acne, psoriasis, leukoderma, and scars. <i>Semin Cutan Med Surg</i> , 27: 285–291	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/19150300

Rotunda AM, Bhupathy AR, and Rohrer TE. 2004. The new age of acne therapy: Light, lasers, and radiofrequency. <i>J Cosmet Laser Ther</i> , 6: 191–200.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/16020203
Sadick NS. 2008. Handheld LED array device in the treatment of acne vulgaris. <i>J Drugs Dermatol</i> , 7: 347–350	415 nm and 633nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/18459515
Seaton ED, Mouser PE, Charakida A, Alam S, Seldon PM, and Chu AC. 2006. Investigation of the mechanism of action of nonablative pulsed-dye laser therapy in photorejuvenation and inflammatory acne vulgaris. <i>Br J Dermatol</i> , 155: 748–755.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/16965424
Stathakis V, Kilkenny M, and Marks R. 1997. Descriptive epidemiology of acne vulgaris in the community. <i>Australas J Dermatol</i> , 38: 115–123	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/9293656

Skin Rejuvenation

Bhat J, Birch J, Whitehurst C, and Lanigan SW. 2005. A single-blinded randomised controlled study to determine the efficacy of Omnilux Revive facial treatment in skin rejuvenation. <i>Lasers Med Sci</i> , 20: 6–10	n/a	20 min treatments three times a week for three weeks	https://www.ncbi.nlm.nih.gov/pubmed/15909229
Calderhead RG, Kubota J, Trelles MA, and Ohshiro T. 2008. One mechanism behind LED phototherapy for wound healing and skin rejuvenation: Key role of the mast cell. <i>Laser Ther</i> , 17: 141–148	830 nm	4.3 treatments per injury, range 2 – 6	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4846838/
Lee MW. 2002. Combination visible and infrared lasers for skin rejuvenation. <i>Semin Cutan Med Surg</i> , 21: 288–300.	532 nm and 1064 nm	3 to 6 times at monthly intervals	https://www.ncbi.nlm.nih.gov/pubmed/12512652

Lee SY, Park KH, Choi JW, Kwon JK, Lee DR, Shin MS, Lee JS, You CE, Park MY. 2007a. A prospective, randomized, placebo-controlled, double-blinded, and split-face clinical study on LED phototherapy for skin rejuvenation: Clinical, profilometric, histologic, ultrastructural, and biochemical evaluations and comparison of three different treatment settings. <i>J Photochem Photobiol B</i> , 88: 51–67.	830nm and 633nm	twice a week for four weeks	https://www.ncbi.nlm.nih.gov/pubmed/17566756
Russell BA, Kellett N, and Reilly LR. 2005. A study to determine the efficacy of combination LED light therapy (633 nm and 830 nm) in facial skin rejuvenation. <i>J Cosmet Laser Ther</i> 7: 196–200.	633 nm and 830 nm	nine light therapy treatments	https://www.ncbi.nlm.nih.gov/pubmed/16414908

Reduce inflammation

Alves, A. C., Vieira, R., Leal-Junior, E., Dos Santos, S., Ligeiro, A. P., Albertini, R., Junior, J., and De Carvalho, P. 2013. Effect of low-level laser therapy on the expression of inflammatory mediators and on neutrophils and macrophages in acute joint inflammation. <i>Arthritis Res Ther</i> , 15, R116.	808 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/24028507
Bortone, F., Santos, H. A., Albertini, R., Pesquero, J. B., Costa, M. S., and Silva, J. A., Jr. 2008. Lowlevel laser therapy modulates kinin receptors mRNA expression in the subplantar muscle of rat paw subjected to carrageenan-induced inflammation. <i>Int Immunopharmacol</i> , 8, 206–210.	660 or 684 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/18182228
Ferreira, D., Zangaro, R., Villaverde, B., Cury, Y., Frigo, L., Piccolo, G., Longo, I., and Barbarosa, D. 2005. Analgesic effect of He-Ne (632.8 nm) low-level laser therapy on acute inflammation pain. <i>Photomed Laser Surg</i> , 23, 177–181.	632.8 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/15910182
Laraia, E. M., Silva, I. S., Pereira, D. M., Dos Reis, F. A., Albertini, R., De Almeida, P., Leal Junior, E. C., and De Tarso Camillo De Carvalho, P. 2012. Effect of low-level laser therapy (660 nm) on acute inflammation induced by tenotomy of Achilles tendon in rats. <i>Photochem Photobiol</i> , 88, 1546–1550.	660 nm	6, 24 and 72 h	https://www.ncbi.nlm.nih.gov/pubmed/22621670

Pallotta, R. C., Bjordal, J. M., Frigo, L., Leal Junior, E. C., Teixeira, S., Marcos, R. L., Ramos, L., De Moura Messias, F., and Lopes-Martins, R. A. 2011. Infrared (810 nm) low-level laser therapy on rat experimental knee inflammation. <i>Lasers Med Sci</i> , 27(1), 71–78.	810-nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/21484455
Prianti, A. C., Jr., Silva, J. A., Jr., Dos Santos, R. F., Rosseti, I. B., and Costa, M. S. 2014. Low-level laser therapy (LLLT) reduces the Cox-2 mRNA expression in both subplantar and total brain tissues in the model of peripheral inflammation induced by administration of carrageenan. <i>Lasers Med Sci</i> , 29(4), 1397–1403.	660 nm.	n/a	https://www.ncbi.nlm.nih.gov/pubmed/24532118
Rees, J. D., Stride, M., and Scott, A. 2013. Tendons: Time to revisit inflammation. <i>Br J Sports Med</i> , 48(21), 1553–1557.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/23476034
Soriano, F., Campana, V., Moya, M., Gavotto, A., Simes, J., Soriano, M., Soriano, R., Spitale, L., and Palma, J. 2006. Photobiomodulation of pain and inflammation in microcrystalline arthropathies: Experimental and clinical results. <i>Photomed Laser Surg</i> , 24, 140–150.	633 nm	daily for 10 consecutive days	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3799039/

Pain Treatment

Alayat, M. S., Atya, A. M., Ali, M. M., and Shosha, T. M. 2013. Long-term effect of high-intensity laser therapy in the treatment of patients with chronic low back pain: A randomized blinded placebo-controlled trial. <i>Lasers Med Sci</i> , 29(3): 1065–1073.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/24178907
Basford, J., Sheffield, C., and Harmsen, W. 1999. Laser therapy: A randomised, controlled trial of the effects of low-intensity Nd:Yag laser irradiation on musculoskeletal back pain. <i>Arch Phys Med Rehabil</i> , 80, 647–652.	1064nm	90 seconds at eight symmetric points along the lumbosacral spine three times a week for 4 weeks	https://www.ncbi.nlm.nih.gov/pubmed/10378490
Bingol, U., Altan, L., and Yurtkuran, M. 2005. Low-power laser treatment for shoulder pain. <i>Photomed Laser Surg</i> , 23, 459–464.	904 nm	10 sessions during a period of 2 weeks	https://www.ncbi.nlm.nih.gov/pubmed/16262574

Ceylan, Y., Hizmetli, S., and Silig, Y. 2004. The effects of infrared laser and medical treatments on pain and serotonin degradation products in patients with myofascial pain syndrome. A controlled trial. <i>Rheumatol Int</i> , 24, 260–263.	810nm	once a day for 10 consecutive days	https://www.ncbi.nlm.nih.gov/pubmed/14628149
Chow, R. T., Lopes-Martins, R., Johnson, M., and Bjordal, J. M. 2009. Efficacy of low-level laser therapy in the management of neck pain: A systematic review and meta-analysis of randomised, placebo and active treatment controlled trials. <i>Lancet</i> , 374, 1897–1908.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/19913903
De Medeiros, J. S., Vieira, G. F., and Nishimura, P. Y. 2005. Laser application effects on the bite strength of the masseter muscle, as an orofacial pain treatment. <i>Photomed Laser Surg</i> , 23, 373–376.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/16144479
Eren, F., Altinok, B., Ertugral, F., and Tanboga, I. 2013. The effect of erbium, chromium:yttrium-scandium-gallium-garnet (Er,Cr:Ysgg) laser therapy on pain during cavity preparation in paediatric dental patients: A pilot study. <i>Oral Health Dent Manag</i> , 12, 80–84.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/23756423
Ferreira, D., Zangaro, R., Villaverde, B., Cury, Y., Frigo, L., Piccolo, G., Longo, I., and Barbarosa, D. 2005. Analgesic effect of He-Ne (632.8 nm) low-level laser therapy on acute inflammation pain. <i>Photomed Laser Surg</i> , 23, 177–181	632.8 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/15910182
Fiore, P., Panza, F., Cassatella, G., Russo, A., Frisardi, V., Solfrizzi, V., Ranieri, M., Di Teo, L., and Santamato, A. 2011. Short-term effects of high-intensity laser therapy versus ultrasound therapy in the treatment of low back pain: A randomized controlled trial. <i>Eur J Phys Rehabil Med</i> , 47, 367–373.	n/a	15 treatment sessions, during 3 weeks	https://www.ncbi.nlm.nih.gov/pubmed/21654616
Gworys, K., Gasztych, J., Puzder, A., Gworys, P., and Kujawa, J. 2012. Influence of various laser therapy methods on knee joint pain and function in patients with knee osteoarthritis. <i>Ortop Traumatol Rehabil</i> , 14, 269–277	810 nm	1 or 2 treatments	https://www.ncbi.nlm.nih.gov/pubmed/22764339

Venezian, G. C., Da Silva, M. A., Mazzetto, R. G., and Mazzetto, M. O. 2010. Lowlevel laser effects on pain to palpation and electromyographic activity in TMD patients: A double-blind, randomized, placebo-controlled study. <i>Cranio</i> , 28, 84–91.	780 nm	twice a week (four weeks). Forty-eight (48) patients	https://www.ncbi.nlm.nih.gov/pubmed/20491229
Mckibbin, L. S., and Downie, R. 1991. Treatment of post-herpetic neuralgia using a 904 nm (infrared) low incident energy laser: A clinical study. <i>Laser Ther.</i> 3, 35–39.	632.8 nm, 780 nm, 830 nm, 904 nm	5 trials, 188 participants	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3802126/
Namazawa, R., Kemmotsu, O., Otsuka, H., Kakehata, J., Hashimoto, T., Tamagawa, S., and Maumi, T. 1996. The role of laser therapy in intensive pain management of postherpetic neuralgia. <i>Laser Therapy</i> , 8, 143–148.	n/a	5 minutes and 6 seconds, 15 consecutive days	https://www.ncbi.nlm.nih.gov/pubmed/20921635
Tanboga, I., Eren, F., Altinok, B., Peker, S., and Ertugral, F. 2011. The effect of lowlevel laser therapy on pain during dental tooth-cavity preparation in children. <i>Eur Arch Paediatr Dent</i> , 12, 93–95.	980 nm	20 seconds, single dose, 44 participants	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5775948/
Trelles, M., Mayayo, E., Miro, L., Rigau, J., Baudin, G., and Calderhead, R. 1989. The action of low reactive laser therapy (LLLT) on mast cells: A possible pain relief mechanism examined. <i>Laser Ther.</i> 1, 27–30.	488, 514.5, 532, 633, 638, 670, 830, 880, 980 or 1064 nm	n/a	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4639680/
Umegaki, S., Tanaka, Y., Hisakai, M., and Koshimoto, H. 1989. Effectiveness of low-power laser therapy on low-back pain: Double-blind comparative study to evaluate the analgesic effect of low power laser therapy on low back pain. <i>Clin Rep.</i> 23, 2838–2846.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/12605431
Venezian, G. C., Da Silva, M. A., Mazzetto, R. G., and Mazzetto, M. O. 2010. Lowlevel laser effects on pain to palpation and electromyographic activity in TMD patients: A double-blind, randomized, placebo-controlled study. <i>Cranio</i> , 28, 84–91.	780 nm	twice a week (four weeks), Forty-eight (48) patients	https://www.ncbi.nlm.nih.gov/pubmed/20491229
Walker, J. 1983. Relief from chronic pain by low power laser irradiation. <i>Neurosci Lett</i> , 43, 339–344.	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/6200808

Hair loss treatment

Avci P, Gupta GK, Clark J, Wikonkal N, and Hamblin, MR. (2014). Low-level laser (light) therapy (LLLT) for treatment of hair loss. *Lasers Surg Med*, 46, 2, pp. 144–151.

n/a

n/a

<https://www.ncbi.nlm.nih.gov/pubmed/23970445>

Jimenez JJ, Wikramanayake TC, Bergfeld W, Hordinsky M, Hickman G, Hamblin MR, and Schachner LA. (2014). Efficacy and safety of a low-level laser device in the treatment of male and female pattern hair loss: A multicenter, randomized, sham device-controlled, double-blind study. *Am J Clin Dermatol*, 15, pp. 115–127.

n/a

three times a week for 26 weeks

<https://www.ncbi.nlm.nih.gov/pubmed/24474647>

Lanzafame R, Blanche R, Bodian A, Chiacchierini R, Fenandez-Obregon A, Kazmirek E, and Raymond J. (2013). The growth of human scalp hair mediated by visible red light laser and LED sources in males. *Lasers Surg Med*, 45, S25, pp. 12.

655 nm

every other day × 16 weeks, 60 treatments, 25 minute treatment

<https://www.ncbi.nlm.nih.gov/pubmed/24078483>

Wikramanayake TC, Rodriguez R, Choudhary S, Mauro LM, Nouri K, Schachner LA, and Jimenez JJ. (2012). Effects of the Lexington LaserComb on hair regrowth in the C3H/HeJ mouse model of alopecia areata. *Lasers Med Sci*, 27, 2, pp. 431–436

655 nm

20 s daily, three times per week for a total of 6 weeks

<https://www.ncbi.nlm.nih.gov/pubmed/21739260>

Wikramanayake TC, Villasante AC, Mauro LM, Nouri K, Schachner LA, Perez CI, and Jimenez JJ. (2013). Low-level laser treatment accelerated hair regrowth in a rat model of chemotherapy-induced alopecia (CIA). *Lasers Med Sci*, 28, 3, pp. 701–706.

n/a

n/a

<https://www.ncbi.nlm.nih.gov/pubmed/22696077>

Fushimi T, Inui S, Ogasawara M, Nakajima T, Hosokawa K, Itami S. (2011). Narrow-band red LED light promotes mouse hair growth through paracrine growth factors from dermal papilla. *J Dermatol Sci*, 64, 3, pp. 246–248.

n/a

n/a

<https://www.ncbi.nlm.nih.gov/pubmed/21996311>

Scars treatment

Barolet D and Boucher A. 2010. Prophylactic low-level light therapy for the treatment of hypertrophic scars and keloids: A case series. *Lasers Surg Med*, 42: 597–601.

805 nm

30 days

<https://www.ncbi.nlm.nih.gov/pubmed/20662038>

Bouzari N, Davis SC, and Nouri K. 2007. Laser treatment of keloids and hypertrophic scars. *Int J Dermatol*, 46: 80–88. 585 nm n/a <https://www.ncbi.nlm.nih.gov/pubmed/17214728>

Railan D and Alster TS. 2008. Laser treatment of acne, psoriasis, leukoderma, and scars. *Semin Cutan Med Surg*, 27: 285–29 n/a n/a <https://www.ncbi.nlm.nih.gov/pubmed/19150300>

Psoriasis Treatment

Ablon G. 2010. Combination 830-nm and 633-nm light-emitting diode phototherapy shows promise in the treatment of recalcitrant psoriasis: Preliminary findings. *Photomed Laser Surg*, 28: 141–146. 830-nm and 633-nm two 20-min sessions over 4 or 5 weeks, with 48 h between sessions <https://www.ncbi.nlm.nih.gov/pubmed/19764893>

Asawanonda P, Anderson RR, Chang Y, and Taylor CR. 2000. 308-nm excimer laser for the treatment of psoriasis: A dose-response study. *Arch Dermatol*, 136: 619–624. 308-nm 1, 2, 4, and 20 treatments <https://www.ncbi.nlm.nih.gov/pubmed/10815855>

Berns MW, Rettenmaier M, McCullough J, Coffey J, Wile A, Berman M, DiSaia P, and Weinstein G. 1984. Response of psoriasis to red laser light (630 nm) following systemic injection of hematoporphyrin derivative. *Lasers Surg Med*, 4: 73–77. 630 nm n/a <https://www.ncbi.nlm.nih.gov/pubmed/6235419>

De Leeuw J, Van Lingen RG, Both H, Tank B, Nijsten T, and Martino Neumann HA. 2009. A comparative study on the efficacy of treatment with 585 nm pulsed dye laser and ultraviolet B-TL01 in plaque type psoriasis. *Dermatol Surg*, 35: 80–91 585 nm n/a <https://www.ncbi.nlm.nih.gov/pubmed/19076190>

Gattu S, Rashid RM, and Wu JJ. 2009. 308-nm excimer laser in psoriasis vulgaris, scalp psoriasis, and palmoplantar psoriasis. *J Eur Acad Dermatol Venereol*, 23: 36–41. 308-nm n/a <https://www.ncbi.nlm.nih.gov/pubmed/18717744>

Trehan M and Taylor CR. 2002. Medium-dose 308-nm excimer laser for the treatment of psoriasis. *J Am Acad Dermatol*, 47: 701–708 308-nm 3 times per week for up to 8 weeks <https://www.ncbi.nlm.nih.gov/pubmed/12399761>

Finlay AY, Khan GK, Luscombe DK, and Salek MS. 1990. Validation of sickness impact profile and psoriasis disability index in psoriasis. *Br J Dermatol*, 123: 751–756. n/a n/a <https://www.ncbi.nlm.nih.gov/pubmed/2265090>

Vitiligo

Lan CC, Wu CS, Chiou MH, Chiang TY, and Yu HS. 2009. Low-energy heliumneon laser induces melanocyte proliferation via interaction with type IV collagen: Visible light as a therapeutic option for vitiligo. <i>Br J Dermatol</i> , 161: 273–280.	632.8 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/19438447
Lan CC, Wu CS, Chiou MH, Hsieh PC, and Yu HS. 2006. Low-energy heliumneon laser induces locomotion of the immature melanoblasts and promotes melanogenesis of the more differentiated melanoblasts: Recapitulation of vitiligo repigmentation <i>in vitro</i> . <i>J Invest Dermatol</i> , 126: 2119–2126	632.8 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/16691191 https://www.sciencedirect.com/science/article/pii/S002202X15301184
Yu HS. 2000. Treatment of vitiligo vulgaris with helium-neon laser. <i>MB Derma</i> 35: 13–18.	632.8 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/19438447

Laser Acupuncture

Litscher, G., Wang, L., Wang, X., and Gaischek, I. (2013). Laser acupuncture: Two acupoints (Baihui, Neiguan) and two modalities of laser (658 nm, 405 nm) induce different effects in neurovegetative parameters. <i>Evid Based Complement Alternat Med</i> , doi:10.1155/2013/432764.	405 nm, 658 nm	10 minutes	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3686055/
Cafaro, A., Arduino, P. G., Gambino, A., Romagnoli, E., and Broccoletti, R. (2015). Effect of laser acupuncture on salivar flow rate in patients with Sjögren's syndrome. <i>Lasers Med Sci</i> , 30(6), pp. 1805–1809.	650 nm	120 s per acupoint	https://www.ncbi.nlm.nih.gov/pubmed/24820476
Ferreira, D. C. A., De Rossi, A., Torres, C. P., Galo, R., Paula-Silva, F. W. G., and Queiroz, A. M. (2014). Effect of laser acupuncture and auricular acupressure in a child with trismus as a sequela of medulloblastoma. <i>Acupunct Med</i> , 32, pp. 190–193	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/24384541
Sutalangka, C., Wattanathorn, J., Supaporn, M., Thukhammee, W., Wannanon, P., and Tong-un, T. (2013). Laser acupuncture improves memory impairment in an animal model of Alzheimer's disease. <i>J Acupunc Meridian Stu</i> , 6(5), pp. 247–251.	405 nm	e daily for 10 minutes for a period of 14 days	https://cyberleninka.org/article/n/128980.pdf

<p>Adamskaya, N., Dungal, P., Mittermayr, R., Hartinger, J., Feichtinger, G., Wassermann, K., Redl, H., and van Griensven, M. (2011). Light therapy by blue LED improves wound healing in an excision model in rats. <i>Injury</i>, 42(9), pp. 917–921</p>	<p>470 nm, 630 nm</p>	<p>five consecutive days for 10 min</p>	<p>https://www.ncbi.nlm.nih.gov/pubmed/22081819</p>
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LLLT Therapy to Improve Muscle Performance and Prevent Damage

<p>Dos Reis FA, da Silva BA, Laraia EM, de Melo RM, Silva PH, Leal-Junior EC, et al. Effects of pre- or post-exercise low-level laser therapy (830 nm) on skeletal muscle fatigue and biochemical markers of recovery in humans: Double-blind placebo-controlled trial. <i>Photomed Laser Surg</i>. 2014; 32(2): 106–112. Epub 2014/01/25.</p>	<p>830 nm</p>	<p>two sessions, with a 1 week interval between them</p>	<p>https://www.ncbi.nlm.nih.gov/pubmed/24456143</p>
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<p>Lopes-Martins RA, Marcos RL, Leonardo PS, Prianti AC, Jr., Muscara MN, Aimbire F, et al. Effect of low-level laser (Ga-Al-As 655 nm) on skeletal muscle fatigue induced by electrical stimulation in rats. <i>J Appl Physiol</i> (1985). 2006; 101(1): 283–288. Epub 2006/04/22.</p>	<p>655 nm</p>	<p>n/a</p>	<p>https://www.ncbi.nlm.nih.gov/pubmed/16627677</p>
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<p>Patrocínio T, Sardim AC, Assis L, Fernandes KR, Rodrigues N, and Renno AC. Effect of low-level laser therapy (808 nm) in skeletal muscle after resistance exercise training in rats. <i>Photomed Laser Surg</i>. 2013; 31(10): 492–498. Epub 2013/10/10</p>	<p>808 nm</p>	<p>n/a</p>	<p>https://www.ncbi.nlm.nih.gov/pubmed/24102167</p>
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<p>Leal-Junior EC, Lopes-Martins RA, de Almeida P, Ramos L, Iversen VV, and Bjordal JM. Effect of low-level laser therapy (GaAs 904 nm) in skeletal muscle fatigue and biochemical markers of muscle damage in rats. <i>Eur J Appl Physiol</i>. 2010; 108(6): 1083–1088. Epub 2009/12/22.</p>	<p>904 nm</p>	<p>n/a</p>	<p>https://www.ncbi.nlm.nih.gov/pubmed/20024577</p>
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<p>Leal-Junior EC, Lopes-Martins RA, Dalan F, Ferrari M, Sbabo FM, Generosi RA, et al. Effect of 655 nm low-level laser therapy on exercise-induced skeletal muscle fatigue in humans. <i>Photomed Laser Surg</i>. 2008; 26(5): 419–424. Epub 2008/09/27.</p>	<p>655-nm</p>	<p>two sessions (on day 1 and day 8) at a 1-wk interval,</p>	<p>https://www.ncbi.nlm.nih.gov/pubmed/18817474</p>
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Leal-Junior EC, Lopes-Martins RA, Vanin AA, Baroni BM, Grosselli D, De Marchi T, et al. Effect of 830 nm low-level laser therapy in exercise-induced skeletal muscle fatigue in humans. <i>Lasers Med Sci</i> . 2009; 24(3): 425–431. Epub 2008/07/24.	830 nm	200 s total irradiation time	https://www.ncbi.nlm.nih.gov/pubmed/18649044
de Almeida P, Lopes-Martins RA, De Marchi T, Tomazoni SS, Albertini R, Correa JC, et al. Red (660 nm) and infrared (830 nm) low-level laser therapy in skeletal muscle fatigue in humans: What is better? <i>Lasers Med Sci</i> . 2012; 27(2): 453–458. Epub 2011/08/05.	660 or 830 nm	100 s irradiation per point,	https://www.ncbi.nlm.nih.gov/pubmed/21814736
Leal-Junior EC, Lopes-Martins RA, Baroni BM, De Marchi T, Taufer D, Manfro DS, et al. Effect of 830 nm low-level laser therapy applied before high-intensity exercises on skeletal muscle recovery in athletes. <i>Lasers Med Sci</i> . 2009; 24(6): 857–863. Epub 2008/12/06.	830 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/19057981
Toma RL, Tucci HT, Antunes HK, Pedroni CR, de Oliveira AS, Buck I, et al. Effect of 808 nm low-level laser therapy in exercise-induced skeletal muscle fatigue in elderly women. <i>Lasers Med Sci</i> . 2013; 28(5): 1375–1382. Epub 2013/01/09.	808 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/23296713
de Brito Vieira WH, Bezerra RM, Queiroz RA, Maciel NF, Parizotto NA, and Ferraresi C. Use of low-level laser therapy (808 nm) to muscle fatigue resistance: A randomized double-blind crossover trial. <i>Photomed Laser Surg</i> . 2014; 32(12): 678–685. Epub 2014/12/17.	808 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/25496083
Felismino AS, Costa EC, Aoki MS, Ferraresi C, de Araujo Moura Lemos TM, and de Brito Vieira WH. Effect of low-level laser therapy (808 nm) on markers of muscle damage: A randomized double-blind placebo-controlled trial. <i>Lasers Med Sci</i> . 2014; 29(3): 933–938. Epub 2013/09/06.	808 nm	10 s on four points	https://www.ncbi.nlm.nih.gov/pubmed/24005882
Ferraresi C, de Brito Oliveira T, de Oliveira Zafalon L, de Menezes Reiff RB, Baldissera V, de Andrade Perez SE, et al. Effects of low-level laser therapy (808 nm) on physical strength training in humans. <i>Lasers Med Sci</i> . 2011; 26(3): 349–358. Epub 2010/11/19.	808 nm	140 s	https://www.ncbi.nlm.nih.gov/pubmed/21086010

Vieira WH, Ferraresi C, Perez SE, Baldissera V, and Parizotto NA. Effects of low-level laser therapy (808 nm) on isokinetic muscle performance of young women subjected to endurance training: A randomized controlled clinical trial. <i>Lasers Med Sci</i> . 2012; 27(2): 497–504. Epub 2011/08/27.	808 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/21870127
Kelencz CA, Munoz IS, Amorim CF, and Nicolau RA. Effect of low-power gallium-aluminum-arsenium noncoherent light (640 nm) on muscle activity: A clinical study. <i>Photomed Laser Surg</i> . 2010; 28(5): 647–652. Epub 2010/10/22	640 nm	60 s	https://www.ncbi.nlm.nih.gov/pubmed/20961231
Paolillo FR, Milan JC, Aniceto IV, Barreto SG, Rebelatto JR, Borghi-Silva A, et al. Effects of infrared-LED illumination applied during high-intensity treadmill training in postmenopausal women. <i>Photomed Laser Surg</i> . 2011; 29(9): 639–645. Epub 2011/07/14	850 nm	treatment time 30 min	https://www.ncbi.nlm.nih.gov/pubmed/21749263

Visual System Injury and Disease treatment

Albarracin, R., and Valter, K. (2012b). Treatment with 670 nm light protects the cone photoreceptors from white light-induced degeneration. <i>Adv. Exp. Med. Biol.</i> , 723, 121–128	670 nm	15 min per day for 34 weeks	https://www.researchgate.net/publication/272517333_A_safety_and_feasibility_study_of_the_use_of_670_nm_red_light_in_premature_neonates
Albarracin, R., Natoli, R., Rutar, M., Valter, K., and Provis, J. (2013). 670 nm light mitigates oxygen-induced degeneration in the C57BL/6J mouse retina. <i>BMC Neurosci</i> , 14 125–130.	670 nm	once daily for 5 consecutive days	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4015810/
Begum, R., Powner, M.B., Hudson, N., Hogg, C., and Jeffery, G. (2013). Treatment with 670 nm light upregulates cytochrome c oxidase expression and reduces inflammation in an age-related macular degeneration model. <i>PLoS ONE</i> , 8, e57828.	670 nm	6 minutes twice a day for 14 days	https://www.ncbi.nlm.nih.gov/pubmed/23469078

Fitzgerald, M., Bartlett, C.A., Payne, S.C., Hart, N.S., Rodger, J., Harvey, A.R., and Dunlop, S.A. (2010). Near infrared light reduces oxidative stress and preserves function in CNS tissue vulnerable to secondary degeneration following partial transection of the optic nerve. <i>J. Neurotrauma</i> , 27, 2107–2119.	670 nm	30 min exposure	https://www.ncbi.nlm.nih.gov/pubmed/20822460
Fitzgerald, M., Hodgetts, S., van den Heuvel, C., Natoli, R., Hart, N., Valter, K., Harvey, A.R., Vink, R., Provis, J., and Dunlop, S.A. (2013) Red/nearinfrared irradiation therapy for treatment of central nervous system injuries and disorders. <i>Rev. Neurosci.</i> , 24, 205–226	670 and 830 nm	n/a	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4126771/
Ishiguro, M., Ikeda, K., and Tomita, K. (2010). Effect of near-infrared light-emitting diodes on nerve regeneration. <i>J. Orthop. Sci.</i> , 15, 233–239	660 nm	1 h per day for 3 weeks	https://www.ncbi.nlm.nih.gov/pubmed/20358337
Ivandic, B.T., and Ivandic, T. (2008) Low-level laser therapy improves vision in patients with age-related macular degeneration. <i>Photomed. Laser Surg.</i> , 26, 241–245	780 nm	40s	https://www.ncbi.nlm.nih.gov/pubmed/18588438
Karu, T.I., Pyatibrat, L.V., Kolyakov, S.F., and Afanasyeva, N.I. (2008). Absorption measurements of cell monolayers relevant to mechanisms of laser phototherapy: Reduction or oxidation of cytochrome c oxidase under laser radiation at 632.8 nm. <i>Photomed. Laser Surg.</i> 26, 593–599	632.8 nm	10s	https://www.ncbi.nlm.nih.gov/pubmed/19099388
Kokkinopoulos, I., Colman, A., Hogg, C., Heckenlively, J., and Jeffery, G. (2012). Age-related retinal inflammation is reduced by 670 nm light via increased mitochondrial membrane potential. <i>Neurobiol. Aging</i> , 34, 602–609	670 nm	five 90-second exposures over 35 hours.	https://www.ncbi.nlm.nih.gov/pubmed/22595370
Liang, H.L., Whelan, H.T., Eells, J.T., and Wong-Riley, M.T. (2008). Nearinfrared light via light-emitting diode treatment is therapeutic against rotenone- and 1-methyl-4-phenylpyridinium ion-induced neurotoxicity. <i>Neuroscience</i> , 153, 963–974	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/18440709

Natoli, R., Valter, K., Barbosa, M., Dahlstrom, J., Rutar, M., Kent, A., and Provis, J. (2013). 670 nm photobiomodulation as a novel protection against retinopathy of prematurity: Evidence from oxygen-induced retinopathy models. PLoS ONE, 8, e72135	670 nm	3 minutes a day	https://www.ncbi.nlm.nih.gov/pubmed/23951291
Rutar, M., Natoli, R., Albarracin, R., Valter, K., and Provis, J. (2012). 670 nm light treatment reduces complement propagation following retinal degeneration. J. Neuroinflamm., 9, 257–263.	670 nm	3 minutes daily over 5 days	https://www.ncbi.nlm.nih.gov/pubmed/23181358
Szymanski, C.R., Chiha, W., Morellini, N., Cummins, N., Bartlet, C.A., O’Hare Doig, R.L., Savigni, D.L., Payne, S.C., Harvey, A.R., Dunlop, S.A., and Fitzgerald, M. (2013). Paranode abnormalities and oxidative stress in optic nerve vulnerable to secondary degeneration: Modulation by 670 nm light treatment. PLoS ONE, 8, e66448	670 nm	30 minutes per day	https://www.ncbi.nlm.nih.gov/pubmed/23840470

Multiple Sclerosis Treatment

Muili, K. A., Gopalakrishnan, S., Eells, J. T., and Lyons, J. A. (2013). Photobiomodulation induced by 670 nm light ameliorates MOG35-55 induced EAE in female C57BL/6 mice: A role for remediation of nitrosative stress. PLoS ONE, 8, pp. e67358.	670 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/23840675
Muili, K. A., Gopalakrishnan, S., Meyer, S. L., Eells, J. T., and Lyons, J.-A. (2012). Amelioration of experimental autoimmune encephalomyelitis in C57BL/6 mice by photobiomodulation induced by 670 nm light. PLoS ONE, 7, pp. e30655	670 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/22292010

Non-Healing Wounds and Ulcers Therapy

Kim, S.W., Kim, J.S., Lim, W.B., Jeon, S.M., Kim, O.S., Koh, J.T., Kim, C.S., Choi, H.R., and Kim, O.J. (2013). In vitro bactericidal effects of 625, 525, and 425 nm wavelength (red, green and blue) light-emitting diode irradiation. <i>Photomed. Laser Surg.</i> , 31(11), pp. 554–562.	625, 525, and 425 nm	1, 2, 4, and 8 h	https://www.ncbi.nlm.nih.gov/pubmed/24138193
Stadler, I., Evans, R., Narayan, V., Buehner, N., Naim, J.O., and Lanzafame, R.J. (2001). 830 nm irradiation increases wound tensile strength in a diabetic murine model, <i>Lasers Surg. Med.</i> , 28(3), pp. 220–226.	831 nm	Daily over 0-4 days or 3-7 days	https://www.ncbi.nlm.nih.gov/pubmed/11295756
DeLand, M.M., Weiss, R.A., McDaniel, D.H., and Geronemus, R.G. (2007). Treatment of radiation-induced dermatitis with light-emitting diode (LED) photomodulation. <i>Lasers Surg. Med.</i> , 39, pp. 164–168	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/17311276
Hawkins, D., Houreld, N., and Abrahamse, H. (2005). Low level laser therapy (LLLT) as an effective therapeutic modality for delayed wound healing. <i>Ann. N Y Acad. Sci.</i> , 1056, pp. 486–493	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/16387711
Hopkins, J.T., McLodot, T.A., Seegmiller, J.G., and Baxter, G.D. (2004). Low-level laser therapy facilitates superficial wound healing in humans: A triple-blind, sham-controlled study. <i>J. Athl. Train.</i> , 39(3), pp. 223–229	n/a	2 minutes, 5 seconds	https://www.ncbi.nlm.nih.gov/pubmed/15496990 https://www.researchgate.net/publication/10605213_Efficacy_of_low-level_laser_therapy_in_the_management_of_stage_III_deubitus_ulcers_A_prospective_observer-blinded_multicentre_randomised_clinical_trial
Lucas, C., Stanborough, R.W., Freeman, C.L., and DeHaan, R.J. (2000). Efficacy of low-level laser therapy on wound healing in human subjects: A systematic review. <i>Lasers Med. Sci.</i> , 15, pp. 84–93	904 nm	125s	https://www.ncbi.nlm.nih.gov/pubmed/18494640
Saltmarche, A.E. (2008). Low level laser therapy for healing acute and chronic wounds: The Extendicare experience. <i>Int. Wound J.</i> , 5, pp. 351–360	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/18494640

Arthritis Treatment

Hagiwara S, Iwasaka H, Hasegawa A, et al. Pre-irradiation of blood by gallium aluminum arsenide (830 nm) low-level laser enhances peripheral endogenous opioid analgesia in rats. <i>Anesth Analg</i> . 2008; 107: 1058–1063	830 nm	n/a	https://www.ncbi.nlm.nih.gov/pubmed/18713929
Kamrava SK, Farhadi M, Rezvan F, et al. The histological and clinical effects of 630 nanometer and 860 nanometer low-level laser on rabbits' ear punch holes. <i>Lasers Med Sci</i> . 2009; 24(6): 949–954.	980 nm	three minutes for 21 days	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5853997/
Carlos FP, de Paula Alves da Silva M, de Lemos Vasconcelos Silva Melo E, et al. Protective effect of low-level laser therapy (LLLT) on acute zymosan-induced arthritis. <i>Lasers Med Sci</i> . 2014; 29: 757–763	659 nm	10 s	https://www.ncbi.nlm.nih.gov/pubmed/23933663
Chow R, Armati P, Laakso EL, et al. Inhibitory effects of laser irradiation on peripheral mammalian nerves and relevance to analgesic effects: A systematic review. <i>Photomed Laser Surg</i> . 2011; 29: 365–381	n/a	n/a	https://www.ncbi.nlm.nih.gov/pubmed/21456946
Jang H, Lee H. Meta-analysis of pain relief effects by laser irradiation on joint areas. <i>Photomed Laser Surg</i> . 2012; 30: 405–417.	633 to 1000 nm	1 to 300 s	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3412059/