

Supplementary Material

Table S1. Device information, irradiance parameters and treatment parameters of PDNeuro Helmet and PDCare Laser Device used in the study.

PDNeuro Helmet			PDCare Laser Device		
Device information					
Metric	Information		Metric	Information	
Manufacturer	SYMBYX PTY LTD (Australia)		Manufacturer	Spectro Analytic Irradia AB (Sweden), for SYMBYX PTY LTD (Australia)	
Model	SYMBYX Neuro		Model	PDCare 904 nm Laser by SYMBYX	
Year produced	2023		Year produced	2022	
Number of emitters	40 LEDs [20 red + 20 near-infrared (NIR) paired]		Number of emitters	2 (laser diodes)	
Emitter type	Red: AlInGaP LED; Infrared: AlInGaP LED		Emitter type	GaAs laser diode	
Beam delivery	Transcranial		Beam delivery	Contact application on intact skin	
Irradiance parameters					
Parameter (unit)	Value	Information source	Parameter (unit)	Value	Information source
Center wavelength	635 nm (red); 810 nm (NIR)	Manufacturer specification	Center wavelength (nm)	904 nm (NIR)	Manufacturer specification
Spectral bandwidth	Red: ± 15 nm; NIR: ± 35 nm		Spectral bandwidth (nm)	± 10 nm	
Operating mode	Pulsed; 40 Hz, 20% duty cycle		Operating mode	Pulsed (super-pulsed); 50 Hz ± max 20%, pulse duration 7 μs	
Radiant power	Red: 25 mW per LED; NIR: 52 mW per LED; Total Red: 500 mW Total NIR: 1040 mW		Radiant power	30 mW per diode; 60 mW total	
Aperture diameter	1.13 cm		Aperture diameter	0.9 cm per diode	
Irradiance at aperture	Red: 25 mW/cm ² ; NIR: 52 mW/cm ²		Irradiance at aperture	30 mW / 63.5 mm ² = 472 W/m ² = 47.2 mW/cm ² per diode	
Treatment parameters					
Parameter (unit)	Value	Parameter (unit)	Value		
Beam spot size at target	1 cm ²	Beam spot size at target	63.5 mm ² = 0.635 cm ² per aperture (9 mm diameter at contact). Total = 1.27 cm ² (2 × 0.635 cm ²)		
Irradiance at target	Red: 25 mW/cm ² ; NIR: 52 mW/cm ²	Irradiance at target	472 W/m ² = 47.2 mW/cm ² (contact application)		
Exposure duration	1,440 sec total (720 sec RED + 720 sec NIR)	Exposure duration	60 sec per treatment point		
Radiant exposure	Red: 18 J/cm ² ; NIR: 37.4 J/cm ²	Radiant exposure	1.8 J/cm ² per diode per point		
Radiant energy	Red: 360 J; NIR: 748.8 J; Total Combined: 1,108.8 J	Radiant energy	1.8 J per diode per point; 3.6 J total per point		
Number of points irradiated	N/A—helmet worn continuously, not point-by-point	Number of points irradiated	9 abdominal + 2 posterior neck (C1 and C2)		
Area irradiated	~20 cm ² per wavelength	Area irradiated	13.97 cm ²		

Application technique	Transcranial (non-contact helmet)	Application technique	Skin contact (hand-held)
Number and frequency of treatment sessions	2 days/week (weeks 1 to 4) increased to 3 days/week (weeks 5 to 8)	Number and frequency of treatment sessions	2 days/week (weeks 1 to 4) increased to 3 days/week (weeks 5 to 8)
Total radiant energy	22,176 J	Total radiant energy	64.8 J (abdomen) and 7.2 J (neck)

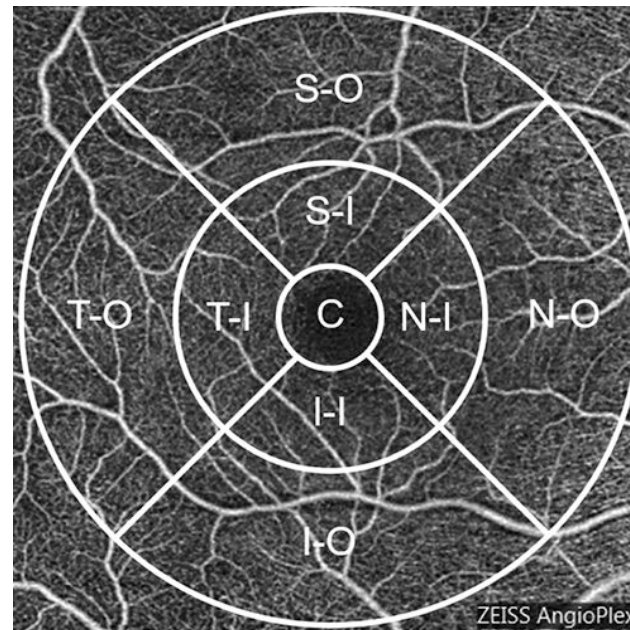


Figure S1. Example of a 3×3 mm optical coherence tomography-angiography (OCT-A) scan. Vascular perfusion at the macula was measured using the AngioPlex OCT-A module on the Cirrus HD-OCT 5000 device, with perfusion in the superficial retinal capillary plexus quantified at the central macular zone and across the four quadrants (superior, inferior, nasal, and temporal) based on the Early Treatment Diabetic Retinopathy Study (ETDRS) grid sectors. Vascular perfusion values from the inner (I) and outer (O) zones were averaged within each quadrant.