

Supplementary Data

Supplement on Technology

Four Omnilux New-U handheld devices were modified by the manufacturer (Photomedex, Inc.) for their use in this study. The active devices were modified in order to emit only NIR light. All the red LEDs were removed and replaced with 100 Ohm resistors, which could not be powered. The NIR LEDs (invisible light), the two yellow LEDs (signaling device is on), and the fan all turned on when the handheld switch was shifted. The control devices were modified so that neither NIR nor red light could be emitted. Red LEDs were also removed and replaced with 100 Ohm resistors with the electric current settings to these resistors being changed to achieve a sensation of heating similar to that of the NIR LEDs of the active devices. The two yellow LEDs and fan turned on, and the resistors were powered, when the handheld switch was shifted.

Proper functioning of the four devices was ensured prior to study implementation and halfway through enrollment by the Photomedex engineering team. At the conclusion of the study, the four Omnilux new-U LED devices were characterized to determine dosimetry by Litecure, an independent company (Fig. 2). Measurements were made using the following equipment: power detector [Ophir L40(150)A], power meter (Ophir Nova), beam profile camera (Coherent LaserCam HR), and beam profile analysis software (Coherent BeamView

USB Version 4.6.3). Units 1124054 and 1124055 were not functional, so no measurements were taken from these devices. Profiles of units 1124052 and 1124053 were, respectively, total device power 1080 and 1390 mW; average intensity (irradiance) over full device, 31.6 and 40.8 mW/cm²; maximum intensity (averaged over 1cm² aperture), 53.5 and 67.9 mW/cm². Given that the two devices were interchangeably used on the left and right side of the forehead, we averaged the intensities for the two devices and obtained an actual irradiance of 36.2 mW/cm² and a maximum intensity of 60.7 mW/cm². Our irradiance was indeed close to the value of 33.2 mW/cm² reported by the manufacturer for the commercially available device.

Based on treatment delivery times, which progressed from 20 to 25 min and 30 min, the fluence ranged from 43.4 J/cm², at first treatment, to 54.3 J/cm² from week 4 to 5, and 65.2 J/cm² from week 6 to study end. However, given there were areas reaching a maximum intensity of 67.9 mW/cm², for those isolated square centimeters (14 areas of 1 cm²), the fluence reached 81.5, 101.9, and 122.2 J/cm², respectively, for the same study weeks. The peak NIR wavelength was measured and was 823 nm, and the full width at half maximum of the NIR wavelength (FWHM) was calculated as 40 nm. Other specifications for the device from the manufacturer included the treatment window of 28.7 cm² per each of the two devices.