PicoWay®

Summary of Peer-Reviewed Articles

Updated September 2024

CE Indications

The PicoWay laser system is CE marked for the following at the specified wavelength:

532 nm: Removal of tattoos for Fitzpatrick Skin Types I-III to treat the following tattoo colors: red, yellow and orange.

730 nm: Removal of tattoos for Fitzpatrick Skin Types II-IV to treat the following tattoo colors: green and blue.

785 nm: Removal of tattoos for Fitzpatrick Skin Types II-IV to treat the following tattoo colors: green and blue.

1064 nm: Removal of tattoos for all Skin Types (Fitzpatrick I-VI) to treat the following tattoo colors: black, brown, green, blue and purple.

The PicoWay laser system is also CE marked for benign pigmented lesions removal for Fitzpatrick Skin Types I-IV.

The Resolve handpiece (1064 nm) is also CE marked for the treatment of acne scars in Fitzpatrick Skin Types II-V.

The Resolve handpieces (532 nm HE, 532nm, 1064nm) are also CE marked for treatment of wrinkles in Fitzpatrick Skin Types I-IV

The Resolve Fusion handpiece (1064 nm) is CE marked for the treatment of wrinkles as well as benign pigmented lesions in Fitzpatrick Skin Types I-IV

The Resolve Fusion handpiece (532 nm) is CE marked for the treatment of benign pigmented lesions in Fitzpatrick Skin Types I-IV, as is the 730 nm handpiece

Successful use of picosecond laser treatment for seborrheic keratosis in three Asian patients

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Swallow MA, Elgash M, Kim SR, Suozzi KC. JAAD Case Rep. 2024 Apr 16;48:46-48.

PicoWay 532 nm HP
Benign Pigmented Lesions

STUDY DETAILS

- Three Asian patients (2 males, 1 female; age range 67-70 years; FST IV) were treated for seborrheic keratoses on the face with a 532-nm picosecond laser.
- Subjects received 3-5 treatments (fluence range 0.5-1.4 J/cm^2; Spot size 3 or 4). Time between treatments was variable and ranged from 1 to 10 months depending on each patient's schedules. The treatment endpoint was a light white frost.

RESULTS

- There was marked improvement in the size, number, and color of the lesions following treatment.
- No post-inflammatory hyperpigmentation, hypopigmentation, significant swelling, or other adverse events were noted.

Open Access https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11107074/

The 730 nm picosecond titanium sapphire laser for treatment of café-au-lait macules in all Skin Types

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Fernandez JK, Guo EL, Richmond H, Friedman PM. Lasers Surg Med. 2024 Mar;56(3):257-262.

PicoWay 730 nm HP
Benign Pigmented Lesions

STUDY DETAILS

- A retrospective review of 14 patients (age range: 10 months–66 years, mean age: 27.4 years, Fitzpatrick Skin Types II–VI) treated for CALMs on the face (11) or body (3) with the 730 nm picosecond titanium sapphire laser.
- Treatment parameters included spot sizes ranging from 3 to 4 mm and fluences ranging from 0.7 to 1.8 J/cm^2. On average, patients received 4.3 treatments, with treatment intervals ranging from 4 to 40 weeks.
- Clinical photographs were graded by 3 outside board-certified dermatologists using a 5-point visual analog scale.

RESULTS

- Overall, patients were rated to have a mean improvement of 26%–50%.
- Two patients (FST III and VI) achieved 100% clearance after 4-5 treatment sessions.
- The 730-nm picosecond titanium sapphire laser is both a safe and effective treatment option, in the right morphologic setting, to improve the cosmetic appearance of CALMs in a wide range of ages and all Skin Types.

Open Access https://onlinelibrary.wiley.com/doi/10.1002/lsm.23769

Treatment of minocycline-induced hyperpigmentation with 730 nm Ti:sapphire picosecond laser

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Alajmi A, Niaz G, Lee K, Bernstein EF. JAAD Case Rep. 2023 Nov 30;43:62-68.

PicoWay 730 nm & 785 nm HPs
Benign Pigmented Lesions

CASE SERIES DETAILS

- Three subjects (age range 66-72 years, FST I-II) with minocycline-induced skin pigmentation on the face were treated with both nanosecond-domain and picosecond domain lasers using a variety of wavelengths.

RESULTS

- Inconsequential response to the Q-switched laser seen in 2 of the 3 patients.
- Case 1: 1064 nm Nd:YAG Q-switched laser treatment had no improvement, additional 3 treatments with 730 nm Ti:sapphire laser achieved pigment clearance.
- Case 2: After Nd:YAG Q-switched laser treatment achieved minimal improvement, treatment with 785 nm Ti:sapphire laser treatment showed significant improvement and additional treatment with 730 nm Ti:sapphire laser achieved dramatic clearing of the pigment.
- The 730 nm wavelength which emits the shortest picosecond-domain pulse currently available in the market, highlights the potential benefits of ultrashort pulse durations in achieving superior outcomes with minimal photothermal effects.

Open Access https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10788405/

Effectiveness of 730 nm Picosecond Laser for the Treatment of Freckles and Solar Lentigines: A Retrospective Analysis

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Che Q, Wa Q, Liu L, et al. Dermatologic Therapy 2023.1 (2023): 2070560.

PicoWay 730 nm HP
Lentigines & Benign Pigmented Lesions

STUDY DETAILS

- Fifty patients (45 females, 5 males; mean age of 32.0 years; FST III-IV) with freckles and solar lentigines were retrospectively evaluated after two treatments with 730 nm picosecond laser (PicoWay, Candela). The treatment parameters were set at 1.5–1.8 J/cm^2, 1 Hz, and 250 ps.
- Clinical evaluation included: lesion clearance and recurrence rates, adverse reactions, and patient satisfaction.

RESULTS

- The lesion clearance rates after one and two treatments were 53.1% and 78.4%, respectively, and the rates after one and six months of treatment were 78.7% and 78.4%, respectively.
- 90% of the patients reported ≥95% clearance of lesions after six months via a questionnaire survey.
- Post-inflammatory hyperpigmentation appeared in two patients, both of whom had Fitzpatrick Skin Type IV. Topical application of hydroquinone accelerated remission.
- There was no recurrence of lesions.
- Among the patients, 86.0% were satisfied with their treatment.

Open Access https://onlinelibrary.wiley.com/doi/full/10.1155/2023/2070560

Comparison of the efficacy and safety of a 730 nm picosecond titanium sapphire laser and a 755 nm picosecond alexandrite laser for the treatment of freckles in Asian patients: A two-center randomized, split-face, controlled trial

Zhang M, Zheng H, Ge Y, et al. Lasers Surg Med. 2023 Sep;55(7):636-641.

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PicoWay 730 nm HP
Benign Pigmented Lesions

STUDY DETAILS

- 86 Asian subjects (mean age 30.70 years; 7 males, 79 females; FST III-IV) with freckles were enrolled to a prospective, split-face comparison study.
- Each side of the subject face was randomly assigned for one treatment with either 730 nm (PicoWay, Candela) picosecond (PS) laser (Fluence 1.80–4.00 J/cm^2; spot size 2.0–3.0 mm) or 755 nm (PicoSure, Cynosure) PS laser (Fluence 3.77–4.80-J/cm^2; spot size 2.3–2.6 mm).
- Efficacy and safety were determined based on blinded visual evaluations and self-reports at each follow-up visit (1, 4, and 8 weeks after treatment).

RESULTS

- Both 730 nm and 755 nm PS lasers showed comparable lesion clearance (68.99 ± 7.42% and 69.27 ± 7.75% average clearance, respectively) and with similar Global Aesthetic Improvement Scale scores (moderate improvement; 4.04 ± 0.31 vs. 4.02 ± 0.30, respectively; $p > 0.05$).
- >60% lesion clearance was found in 95.3% and 91.9% of the 730 and 755 nm PS lasers, respectively ($p = 0.97$).
- The 730 nm laser was less painful than the 755 nm laser with average VAS of 4.69 ± 1.63 vs. 5.65 ± 1.80, respectively ($p < 0.0001$).

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/37265010/

Characterization of picosecond laser-induced optical breakdown using harmonic generation microscopy

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Liu C, Wu PJ, Chia SH, Sun CK, Liao YH. Lasers Surg Med. 2023 Aug;55(6):561-567.

Resolve 1064 nm HP
Harmonic Generation Microscopy

STUDY DETAILS

- Five participants having skin phototype III-IV were recruited for intervention using a picosecond 1064-nm Nd:YAG laser system (PicoWay Resolve 1064 nm handpiece).
- The laser-induced histopathological changes on human skin were examined in vivo using a harmonic generation microscopy (HGM), visualizing second harmonic generation (SHG), and third harmonic generation (THG) contrasts dichromatically.
- SHG refers for collagen distribution, while THG represents for epidermal components in the HGM signal.

RESULTS

- Histological hematoxylin and eosin staining, and in vivo HGM imaging studies revealed the presence of epidermal vacuoles below the stratum granulosum along with keratinocyte degeneration or cytolysis.
- HGM imaging exclusively demonstrated laser-induced shock wave propagation arranged as a THG-bright concentric pattern in the epidermis and loss of SHG signals in the papillary dermis immediately beneath the epidermal vacuoles.
- Alongside generating epidermal vacuoles, **the picosecond 1064-nm Nd:YAG laser induced collagen changes**. **These collagen changes may lead to dermal remodeling and neocollagenesis underlying the picosecond laser treatment.**

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/37051896/

Retrospective Review of the Laser Removal of Facial Cosmetic Tattoos

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Hartman N, Loyal J, Borsack S, Goldman MP, Boen M. Dermatol Surg. 2023 Jun 1;49(6):559-565.

1064 nm & 532 nm HPs
Cosmetic Tattoos

STUDY DETAILS

- A retrospective review chart of the safety and efficacy of picosecond (PS) laser for removal of difficult to treat cosmetic facial tattoos
- 33 patients (32 females; FST I-IV) that were undergoing cosmetic tattoo removal on their face using PicoWay laser were evaluated. 21, 11, and 1 of the patients underwent tattoo removal for eyebrow, eyeliner, and lip liner tattoos, respectively. All subjects underwent at least 1 laser treatment and returned in follow-up after last treatment
- Brown and black tattoos were treated using 1064 nm wavelength (Fluence1.2-12.5 J/cm^2; spot size 2-4 mm)
- Orange, red, pink, and yellow tattoos, resulting from unmasking colors, were treated using the 532 nm wavelength (Fluence 0.6-3 J/cm^2; spot size 2-4 mm)
- In a few cases, a fractionated CO_2 laser was used after the PS laser

RESULTS

- PicoWay was efficacious in clearing cosmetic tattoos. The under-reported unmasking of an orange color post laser treatment can be successfully treated with a 532-nm PS laser
- The average number of treatments to obtain satisfactory results was 3
- 66% percent of subjects were rated as “very much improved” with 76% to 100% of the tattoo removed and 34% of subjects were rated “much improved” with 51% to 75% of the tattoo removed
- 30% of subjects experienced unexpected changes in the tattoo color after initial treatment with 1064-nm PS laser

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/36946770/

Picosecond neodymium-doped yttrium-aluminum-garnet laser therapy for pigmentation due to lichen planus pigmentosus in a patient with skin of color

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Belzer A, Swallow MA, Gowen M, Suozzi KC. JAAD Case Rep. 2023 Feb 13;34:45-47.

PicoWay Zoom 1064 nm & 785 nm HPs
Pigmented Lesions

CASE STUDY DETAILS

- A 73-year-old female with skin of color and diagnosed with lichen planus pigmentosus (LPP), demonstrated deeply pigmented skin with hundreds of 1 to 3 mm dark brown to gray-brown macules coalescing into large patches without scale on the face
- Prior to laser treatment: 2.5% hydrocortisone was applied twice daily for 1 month and simvastatin was discontinued
- Treatment included: 10 laser treatments with PicoWay Zoom 1064 nm, ~1-month apart (Fluence 2.0-2.4 mJ; spot size 3-4 mm; 459-1212 pulses per treatment) & 4 treatments with 785 nm (Fluence 0.6-1.5 mJ; spot size 3-4 mm; 530-755 pulses per treatment)
- Post treatment care included: Ice packs after treatment in office and hourly for the rest of the day. Hydrocortisone 2.5% cream was applied twice daily for 3-5 days after treatment

RESULTS

- Significant improvement of pigmentation reported on both patient and provider evaluation
- Most notable decrease in pigmentation across the nose and blending of previously sharp demarcation between the pigmented macules and normal skin
- Mild swelling was seen following treatments
- No dyspigmentation or scarring developed

Open Access https://pubmed.ncbi.nlm.nih.gov/36936863/

Evaluation of the safety and efficacy of a fractional picosecond 1064 nm laser for post-acne erythema in adult Chinese patients

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Jia X, Zheng L, Fang L,et al. Skin Res Technol. 2023 Jan;29(1):e13274.

Resolve 1064 nm HP
Acne Scars, Erythema

STUDY DETAILS

- 22 Chinese patients (20 females; 2 males) with mean age 30.55 ± 4.58 and FST III-IV, diagnosed with post-acne erythema (PAE), received a single PicoWay treatment using the Resolve 1064 nm handpiece and were followed up at the 8th week
- Clinician erythema assessment scale (CEAS; 0=Clear to 4=Severe), global aesthetic improvement scale (GAIS; 0=Worsened patient to 4=Exceptional improvement) and patients' assessment of satisfaction on a five-point scale (0 Not satisfied to 4 Extremely satisfied) were evaluated
- VISIA automatic analysis of digital photography was also used to evaluate erythema percentile ratings at baseline and follow-up

RESULTS

- The mean CEAS scores fell from 2.74 ± 0.80 to 1.95 ± 0.75 ($p < 0.001$)
- The mean GAIS of PAE improvement was 2.46 ± 0.68
- Erythema percentile scores by VISIA increased from 32.63 ± 7.0 to 45.75 ± 11.45
- The patient satisfaction score was 1.86 ± 1.17 and the average pain scores was 3.27 ± 1.17 (range 2 to 6)
- Moderate erythema and oedema, lasted for 3.84 ± 0.78 days after treatment, 68.18% (15/22) of patients felt pruritus in different degrees and 27.27% of patients encountered acne eruptions (white head type)
- No scar, hyperpigmentation or hypopigmentation was found

Open Access https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10155796/

Randomized, evaluator-blinded comparative study of a potassium titanyl phosphate (KTP) 532-nm picosecond laser and an alexandrite 755-nm picosecond laser for the treatment of solar lentigines in Asians

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Vachiramon V, Namasondhi A, Anuntrangsee T, Jurairattanaporn N. J Cosmet Dermatol. 2022 Oct;21(10):4370-4377.

PicoWay 532 nm HP
Benign Pigmented Lesions

STUDY DETAILS

- 30 subjects (5 males, 25 females, mean age 63 years, Fitzpatrick Skin Types III-IV) with at least 2 solar lentigines ≥ 5-mm in diameter on the upper extremities were enrolled
- Paired lentigines were treated with PicoWay Zoom 532 nm handpiece (3 mm spot size, energy fluence of 0.3–0.9 J/cm^2 at 1 Hz) and alexandrite 755-nm picosecond laser (3 mm spot size, energy fluence of 2.83 J/cm^2)
- Objective assessment was performed with a colorimeter to measure the luminance score (L*)
- 1 blinded dermatologist assessed degree of pigment clearance on a scale of 0 to 4: 0 = no improvement; 4 = excellent improvement (75–100%)

RESULTS AT 6 AND 12 WEEKS AFTER TREATMENT SERIES

- Both lasers showed significant improvement in mean L* from baseline ($p < 0.001$)
- At the 12-week follow-up, 13 lesions (43.3%) treated with the PicoWay laser were rated as over 75% pigment clearance
- All lesions showed crust formation that peeled off within 1-2 weeks
- Post-inflammatory hyperpigmentation developed in one patient treated with alexandrite 755 nm laser (3.3%) and two patients (6.7%) treated with PicoWay at the 3-month follow-up

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/35129875/

Comparison of 1064-nm and Dual-Wavelength (532/1064-nm) Picosecond-Domain Nd:YAG Lasers in the Treatment of Facial Photoaging: A Randomized Controlled Split-Face Study

Zhang M, Huang Y, Wu Q, Lin T, Gong X, Chen H, Wang Y. Lasers Surg Med. 2021 Nov;53(9):1158-1165.

Resolve Treatment & Histological Evaluation Wrinkles

STUDY DETAILS

- 21 Chinese females (mean age 53±7 years) with Fitzpatrick Skin Type III (n=7) and IV (n=13) and moderate to severe facial photoaging underwent PicoWay Resolve treatments and completed the follow-up visits
- 5 monthly treatments to a random half of the face with the Resolve 1064nm handpiece (2 passes, 2.1 mJ/µbeam and 2 Hz), while the contralateral half of the face was treated with 2 passes with the Resolve 532nm handpiece (0.2 mJ/µbeam and 2 Hz) followed by 2 passes with the Resolve 1064nm handpiece (2.1 mJ/µbeam and 2 Hz)
- 2 blinded physicians evaluated the digital clinical images, based on the 5-point global score for photoaging, at 1 and 3 months after the final treatment
- Subjects assessed improvement, using a 5-point Global Aesthetic Improvement Scale (GAIS) of 0 = worsening to 4 = significant improvement
- 4 women had cheek skin biopsies of the treated areas before and within 24 hours of treatment or at 1 month after

RESULTS AT 1- and 3-MONTH FOLLOW-UP AFTER TREATMENT SERIES

- Compared with baseline, the global photoaging scores decreased significantly with either laser treatment, at the 1-month and 3-month follow-up visits ($P < 0.001$)
- The global photoaging scores, GAIS scores, and satisfaction scores did not differ significantly between the Resolve 1064 nm and combined Resolve 532/1064 nm treatments
- Neocollagenesis was observed in the upper dermis of both treatment groups, and elastic fibers were more elongated and orderly

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/33783878/

Treatment of nevus of Ota with 1064 nm picosecond Nd:YAG laser: A retrospective study

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Yang H, Guo L, Jia G, Gong X, Wu Q, Zeng R, Zhang M, Ding H, Fang F, Zheng H, Liu X, Ge Y, Yang Y, Lin T. Dermatol Ther. 2021 Nov;34(6):e15152.

PicoWay 1064 nm HP
Benign Pigmented Lesions

RETROSPECTIVE STUDY DETAILS

- 16 Chinese patients [8 male; 8 female; mean age 16.87 years (4 months to 59 years); Fitzpatrick Skin Type IV] with nevus of Ota (11 brownish lesions; 5 blue-black lesions) were treated with the 1064 nm handpiece
- Total treatment ranged from 1 to 5 sessions at 3–12 months intervals (mean fluence of 1.8–4.3 J/cm^2, 3–4 mm spot size, 5 Hz)
- Blinded evaluation of clinical photography by 3 independent dermatologists, using a 5-point pigment clearance scale: 1 = poor (0%–24%) to 5 = complete (95%–100%)

RESULTS

- The mean efficacy score was 2.56 after one session (n=16), 3.15 (n=13) after two sessions and 3.51 (good to excellent clearance) after 3 sessions (n=9)
- The clearance of blue-black lesions was significantly better than that of brownish lesions (p = 0.001)
- All patients were “very satisfied” (62.5%, 10/16) or “satisfied” (37.5%, 6/16) with treatment
- Postinflammatory hyperpigmentation after treatment was observed in 1 patient (1/16, 6.25%) and gradually disappeared. Hypopigmentation was not observed.

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/34609042/

Treatment of imipramine-induced hyperpigmentation with quality-switched ruby and picosecond lasers

Hamid RN, Yang RG, Munavalli GS. JAAD Case Reports, 2021 Nov;17:12-17.

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PicoWay 532 nm HP
Benign Pigmented Lesions

CASE STUDY DETAILS

- A 72-year-old woman presented to the clinic for evaluation of progressive brown and slate-gray hyperpigmentation that had spread over the face and neck after taking imipramine for >20 years
- The patient underwent a series of 3 treatments, over a period of 17 months, with the PicoWay 532 nm picosecond laser (1.2 – 1.5 J/cm^2 and 4 mm spot size) to the forehead, cheeks, and temples
- Moderate improvement in brown hyperpigmentation following the treatments series
- After a 2-month imipramine taper, the patient underwent 3 treatments with a Q-switched ruby laser (694 nm, 5 mm, 3-4 J/cm^2) and exhibited a significant reduction in slate-gray hyperpigmentation on the cheeks
- After 1 final treatment with the PicoWay 532 nm picosecond laser (1.8 J/cm^2 and 3 mm spot size), there was nearly complete resolution of hyperpigmentation to the forehead, cheeks, and temples
- Purpura developed after 1 PicoWay treatment with high fluence that resolved after a single session of pulsed dye laser (Vbeam® Perfecta, Candela Corporation)
- The patient experienced resolution of pigmentation over a 3-year treatment period without recurrence despite the resumption of low-dose imipramine therapy

Open Access https://www.jaadcasereports.org/article/S2352-5126(21)00632-9/fulltext

Histological Characteristics of Skin Treated With a Fractionated 1064-nm Nd: YAG Picosecond Laser With Holographic Optics

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Zhang M, Guan Y, Huang Y, Zhang E, Lin T, Wu Q. Lasers Surg Med. 2021 Oct;53(8):1073-1079.

Resolve 1064 nm HP Histological Evaluation

STUDY DETAILS

- *In vivo* back skin specimens of 3 volunteers, aged 60, 62, and 65 years, were treated, using the Resolve 1064 nm HP at low (1.3 mJ/µbeam), medium (2.1 mJ/µbeam), and high (2.9 mJ/µbeam) fluence for 2 passes and at 2.9 mJ/µbeam with 10 passes
- Fresh *ex vivo* human foreskin specimens were obtained following circumcisions in Chinese men with Fitzpatrick Skin Types III-IV and treated with the Resolve 1064 nm HP at low (1.3 mJ/µbeam), medium (2.1 mJ/µbeam), and high (2.9 mJ/µbeam) fluence for 2 passes and at 2.9 mJ/µbeam with 10 passes

RESULTS AT 24 HOURS POST TREATMENT

- *In vivo:* Intraepidermal vacuoles (20 to 200 µm in diameter) were observed, along with pigment accumulation and inflammatory cell infiltration in the vacuoles. The vacuoles expanded as the fluence increased.
- Numerous intraepidermal vacuoles were observed, with dermal hemorrhage and inflammatory cell infiltration upon high fluence, multi-pass treatment. Vascular damage and red blood cell extravasation were consistent with the skin erythema and petechiae observed clinically
- The surrounding tissue around the vacuoles retained its structural integrity during this process
- *Ex vivo:* Both epidermal and dermal vacuoles (20 to 250 µm in diameter) were observed, with Melan-A-positive cells in the cystic wall of vacuoles in the epidermal basal layer, and CD31-positive cells in the cystic wall of some dermal vacuoles

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/33565087/

PicoWay® Resolve

Safety and Efficacy of Tattoo Removal Using a Dual-Wavelength 1064/532-nm Picosecond Laser in Patients With Fitzpatrick Skin Type III and IV

Nguyen HT, Doan EVL, Tran TNA, Vu TTP, Phan HN, Sobanko JF. Lasers Surg Med. 2021 Sep;53(7):939-945.

PicoWay 1064 and 532 nm HPs Tattoos

STUDY DETAILS

- 30 males and females (mean age 28 years), with 52 decorative tattoos primarily on the shoulders, back, arms, and thighs, were enrolled
- Up to 6 treatments, at 6 to 8-week intervals, with the PicoWay 1064 nm HP (black, blue, and green dyes) and PicoWay 532 nm HP (red and yellow tattoos), using spot sizes of 3–6 mm, 1–5 Hz and average fluence of 2.7 – 2.9 J/cm^2 (1064 nm HP) and 1.05 – 1.12 J/cm^2 (532 nm HP)
- Blinded evaluation by 3 physicians of photographic improvement of pre- and 1-month post final treatment, categorized as complete response (100% clearance), very good response (>90% clearance), good response (≥75% clearance), or partial response (<75% clearance)

RESULTS AT 1-MONTH FOLLOW-UP AFTER FINAL TREATMENT

- Blinded assessment showed a significant reduction of tattoo appearance for all subjects
- 88.5% (n=46) of tattoos exhibited a “good” response to treatment, with >36% (n=23) of tattoos exhibiting a very good or complete response
- Short-term adverse events were common but resolved without intervention. Higher energy PicoWay 532 nm treatment had increased incidence of immediate side effects (bulla formation, petechiae, edema)
- No hyperpigmentation, scarring, or keloids. 1 case of prolonged hypopigmentation after 3 months of treatment

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/33027538/

Treatment of facial and non-facial lentigines with a 730 nm picosecond titanium: sapphire laser is safe and effective

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Kauvar ANB, Sun R, Bhawan J, Singh G, Ugonabo N, Feng H, Schomacker K. Lasers Surg Med. 2021 Aug 17.

PicoWay 730 nm HP
Benign Pigmented Lesions

STUDY DETAILS

- 16 subjects (4 males, 12 females, mean age 63 years, Fitzpatrick Skin Types II-III) underwent 4 monthly treatments to 30 body sites with 118 treated areas and were evaluated at a 12-week follow-up
- The 1st PicoWay treatment with the 730 nm handpiece was administered with an average beam diameter of 2.9 mm and fluence of 2.2 J/cm^2. Laser fluences were successively increased to 3.9 J/cm^2 and spot size reduced to 2.0 mm for the 4th treatment
- Blinded evaluation by 3 physicians of photographic improvement of pre- and 1- and 3-month post-treatment digital images, using a 5-point scale (0 = 0% clearance, 4=75%–100% clearance (excellent response))
- Investigator Global Improvement Score (IGIS), using an 11-point clearance scale (0 = no improvement, up to a score of 10 = 100% improvement (complete clearance))
- 9 biopsies taken after treatment with 730 and 532 nm picosecond pulses and 755 and 532 nm nanosecond pulses

RESULTS AT 12 WEEKS AFTER TREATMENT SERIES

- 100% of posttreatment images were correctly identified from their respective baseline images
- On average, 73% of treatment areas achieved ≥50% clearance at the 12-week post treatment follow-up
- Mean IGIS score of 7.0
- Mild to moderate erythema and edema were common after treatment
- Histology showed better confinement of thermal energy with picosecond lasers compared to nanosecond lasers

Open Access https://onlinelibrary.wiley.com/doi/10.1002/lsm.23450

The efficacy and safety of fractional 1064 nm Nd:YAG picosecond laser combined with intense pulsed light in the treatment of atrophic acne scar: a split-face study

Feng H, Wu Y, Jiang M, Luo X, Yan S, Lu Z. Lasers Surg Med. 2021 Jun 3.

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Resolve 1064 nm Treatment
Acne Scars

STUDY DETAILS

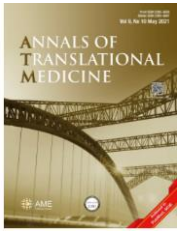
- 15 patients (10 females, 5 males; mean age 22.5 years; Fitzpatrick Skin Types III and IV), with atrophic acne scars accompanied by post-inflammatory erythema (PIE), underwent 5 monthly treatments and were evaluated at 3 months after treatment
- Both sides of the face were treated first with an IPL device (M22™, Lumenis®) followed by treatment to a random side of the face with the Resolve 1064 nm handpiece (3-4 passes with 6 Hz, 1.5-2.5 mJ/µbeam)
- 2 blinded dermatologists calculated the ECCA Scale (échelle D'évaluation Clinique des Cicatrices D'acné) by assessing standard photography
- Pore counts and erythema scores at baseline and follow-up were collected by VISIA® software's automatic analysis

RESULTS AT 3 MONTHS AFTER TREATMENT

- Combined Resolve + IPL-treated side showed significant ECCA score improvement ($P < 0.01$), while IPL alone side did not ($P = 0.1250$)
- Significantly more pore count reduction and scar improvement were seen on the combined treatment side compared to IPL only treated side ($P < 0.05$)
- Statistically significant improvement in erythema ($P < 0.05$) on both sides of the face
- No blistering, pigmentation alternation, scarring, or infection were observed for either side

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/34082477/

PicoWay® Resolve



Comparison of fractionated frequency-doubled 1,064/532 nm picosecond Nd:YAG lasers and non-ablative fractional 1,540 nm Er: glass in the treatment of facial atrophic scars: a randomized, split-face, double-blind trial

Shi Y, Jiang W, Li W, Zhang W, Zou Y. Ann Transl Med. 2021 May;9(10):862.

Resolve Treatment
Acne Scars

STUDY DETAILS

- 22 Fitzpatrick Skin Type IV patients (4 males, 18 females) were included in this study, with an average age of 29.7 years and an average duration of acne scars of 8.8 years
- 4 monthly treatments to a random half of the face with the PicoWay Resolve 1064 nm (1.7 – 1.9 mJ/µbeam) or Resolve 532 nm (0.2 – 0.22 mJ/µbeam) laser with 10 Hz repetition rate and to the contralateral side with a non-ablative fractional 1540 nm Er: glass laser (StarLux™, Palomar) and energy of 65 – 70 J/cm^2, each spot overlapped 10%, and treatment area scanned 4 times (NAFL treatment)
- 2 blinded physicians calculated the ECCA Scale (échelle D'évaluation Clinique des Cicatrices D'acné) by assessing standard photography
- Skin flatness (acne scar height) was measured with a 3-D imaging system (PRIMOS)

RESULTS AT 1 MONTH AFTER TREATMENT SERIES

- PicoWay treatment significantly impacted all acne scar types (P=0.0001), with a more pronounced effect on ECCA score than non-ablative laser for V-type and U-type acne scars
- PicoWay treatment significantly reduced acne scar height (P=0.041), while NAFL did not (P=0.785)
- Greater patient satisfaction with pore size appearance and atrophic scars after PicoWay treatment compared to NAFL

PMC FREE Full text https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8184496/

Novel application of the 730 and 785 nm picosecond titanium sapphire lasers for the treatment of Nevus of Ota

Loh TY, Wu DC. Lasers Surg Med. 2021 Mar 25.

730 nm & 785 nm HPs
Benign Pigmented Lesions

CASE STUDY 1

- A 22-year-old Asian female with Fitzpatrick Skin Type III presented for laser removal of a nevus of Ota on the left cheek
- The patient underwent 4 monthly sessions with the PicoWay 730 nm HP (4 passes with 1.8 J/cm^2 and 3 mm spot size for the 1st treatment and 4 passes with 1 J/cm^2 and 4 mm spot size for successive treatments)
- At 1 month follow-up after 4th PicoWay 730 nm treatment, there was 75% resolution of the nevus of Ota
- No post-inflammatory pigmentary changes or adverse side effects throughout treatment

CASE STUDY 2

- A 43-year-old Asian female with Fitzpatrick Skin Type IV presented for laser removal of a nevus of Ota on the left cheek
- No significant improvement after 2 initial monthly sessions with 755 nm picosecond Alexandrite laser (Picosure®, Cynosure) with 2.33 J/cm^2 and 3 mm spot size
- No significant improvement after 2 monthly sessions with PicoWay 1064 nm spot treatment of focal hyperpigmentation (4.30 J/cm^2 and 3 mm spot size) and PicoWay 1064 nm treatment of diffuse hyperpigmentation with 4 passes of 0.60 J/cm^2 and 6mm spot size
- After 3 months of no treatment, the patient underwent 3 sessions with the PicoWay 785 nm HP (4 passes with 1 J/cm^2 and 3 mm spot size)
- At 2 months follow-up after PicoWay 785 nm treatments, there was near-complete resolution of the nevus of Ota
- No post-inflammatory pigmentary changes or adverse side effects throughout treatment

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/33764565

Successful Treatment of Scalp Micropigmentation with 1064 nm Picosecond Nd:YAG Laser

Wu DC. Lasers Surg Med. 2020 Dec 1. doi: 10.1002/lsm.23364

1064 nm HP
Ink micro-pigmentation

RETROSPECTIVE CASE SERIES DETAILS

- 4 male patients (age range 42-54 years, Skin Type II) with 3-15 years experience of undesired scalp micropigmentation (SMP) were treated with the 1064 nm Nd:YAG handpiece for their SMP removal
- Treatment included 1-3 sessions (3-4 weeks apart) with spot size of 4-5 mm and 8,325 ± 3,376 pulses
- Post-operative care consisted of 1% dimethicone ointment applied twice daily to the affected areas for 3–7 days

RESULTS AT 3-4 WEEKS AFTER TREATMENT

- Clearance of SMP was achieved with 1 treatment session for 3 subjects and with 3 treatment sessions for 1 subject
- The appearance of scarring and/or baseline photodamage also improved in 2 subjects
- There were no unexpected adverse events

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/33289086/

Safety and Efficacy of a Novel 730 nm Picosecond Titanium Sapphire Laser for the Treatment of Benign Pigmented Lesions

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Lipp MB, Angra K, Wu DC. Lasers Surg Med. 2020 Sept 1;10.1002/lsm.23314.

730 nm HP
Pigmentation

STUDY DETAILS

- Retrospective review of 22 patients assessed (19 females, 3 males, mean 45±10 years), majority Fitzpatrick Skin Type III (40.9%) and IV (45.5%), out of 64 patients treated for benign pigmented lesions
- Clinical diagnosis of pigmented lesions in 68% (15) subjects. Treatment indications included: Solar lentigines = 15 (68%), Seborrheic keratosis = 4 (18%), Dermatosis papulosa nigra = 2 (9%) and ephelides = 1 (5%)
- Mean of 1.1±0.3 treatments with the PicoWay 730 nm titanium-sapphire laser-pumped laser were administered: spot size adjusted to the size of the lesion (mean 2.2±0.4 mm), fluence adjusted to achieve whitening of the target lesions (mean 3.4 ± 1.0 J/cm^2)
- Blinded evaluation by 2 physicians of photographic improvement in pigment severity (0: no pigment, 1: light pigment, 2: medium pigment, and 3: dark pigment) and by 2 non-treating investigators for percentage improvement, using a 12-point scale (−1: worse, 10: 100% clearance)

RESULTS AT 4 - 8 WEEKS AFTER TREATMENT

- Statistically significant reduction ($p<0.05$) in discrete pigmentation (mean 1.39 ± 0.6 versus 2.04 ± 0.7 at baseline)
- 86% of patients showed improvement in pigmentation: 60% had ≥50% improvement
- 1–2 days of mild edema and erythema, 3–5 days of mild pigment darkening and superficial crust
- No hypopigmentation, scarring or prolonged erythema

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/32869883/

Localized argyria from silver nasal piercing unresponsive to Q-switched laser successfully treated with a 1064 picoseconds laser

Al-Niaimi F. J Cosmet Dermatol. 2020 Jun;19(6):1535-1536.

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1064 nm HP
Silver Pigmentation

CASE REPORT DETAILS

- A 23-year-old woman with a 1-year history of a grayish silvery macule on the right nasal ala, following a silver jewelry nose piercing, underwent a single treatment session
- The macule was asymptomatic and had been unsuccessfully treated with 1064 nm Q-switched laser, prior to her presentation
- Treatment was performed with the 1064 nm wavelength using the nonfractional Zoom handpiece with a 4 mm spot, with 1.8 J/cm^2 in 2 passes. Erythema was set as an endpoint

RESULTS AT 12 MONTHS AFTER TREATMENT

- The macule gradually disappeared in <2 weeks with no scarring
- No recurrence was seen after 12 months

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/31532572/

Histological Characterization of Age-Related Skin Changes Following the Use of Picosecond Laser: Low Versus High Energy

Kirsanova LV, Araviyskaya ER, Rybakova MG, et al. Dermatol Ther 2020 May 21.

Resolve Treatment
Histological Evaluation

STUDY DETAILS

- 28 women (mean age 51.3 years, range 36 – 60) with signs of age-related photodamage underwent a picosecond laser treatment with the Resolve 1064 nm handpiece
- Group 1 subjects (n=14) received 4 passes in a horizontal and vertical pattern with low energy fluence of 1.1 mJ/µbeam, while Group 2 (n=14) received high energy treatment (2.1 mJ/µbeam)
- Clinical assessment included skin turgor and texture, wrinkle severity and pore openings
- Histological analysis was performed by 2 independent dermatopathologists

RESULTS AT 3 WEEKS AFTER TREATMENT

- Group 2 showed significant improvement with a more pronounced effect on facial skin than in Group 1
- Histopathological examination demonstrated minimal changes in the epidermis and dermis in Group 1 compared to more pronounced morphological changes in Group 2, with a marked elevation in collagen type III expression antibodies in the high fluence group

https://pubmed.ncbi.nlm.nih.gov/32436343/

A Randomized, Split-Face, Double-Blind Comparison Trial Between Fractionated Frequency-Doubled 1064/532 Nm Picosecond Nd:YAG Laser and Fractionated 1927 Nm Thulium Fiber Laser for Facial Photorejuvenation

Wu DC, Jones IT, Boen M, Al-Haddad M, Goldman MP. Lasers Surg Med. 2020 Apr 14.

Resolve Treatment Wrinkles

STUDY DETAILS

- 20 subjects (19 females), with mean age 56.5 ± 11.6 [range 40–73] years and Fitzpatrick Skin Type II-V, were randomly assigned to split-face treatment with PicoWay Resolve (532/1064 nm picosecond lasers) treatment to one side of the face and 1927 nm fractionated thulium fiber laser (TFL) to the contralateral side
- 3 monthly treatments: ½ face 2 passes Resolve 1064 nm laser with energy 1.9 - 2.5 mJ/µbeam, followed by 2 passes with Resolve 532 nm with energy 0.54 - 1.2 mJ/µbeam; ½ face TFL with pulse energy of 20 mJ, treatment levels 3 – 7, correlating with a 30%–50% density, and 8 passes. Forced air-cooling throughout was used for all treatments
- Blinded, non-treating evaluator assessments of photodamage at 6-month follow-up

RESULTS

- Statistically significant improvement was noted in both treatment groups
- Subject 14-day daily diaries showed significantly less downtime (redness, swelling, etc.) associated with Resolve treatments compared to TFL treatments

https://pubmed.ncbi.nlm.nih.gov/32285983/

The first commercial 730 nm picosecond-domain laser is safe and effective for treating multicolor tattoos

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Bernstein EF, Schomacker KT, Shang X, Alessa D, Algzlan H, Paranjape A. Lasers Surg Med. 2020 Mar 24.

730 nm HP
Tattoos

STUDY DETAILS

- 15 subjects (5 males, 10 females, mean 45 years, Fitzpatrick Skin Types I-III) with 20 tattoos were enrolled
- 4 treatments with a new 730 nm, titanium-sapphire laser-pumped laser were administered
- Blinded evaluation by 4 physicians of photographic improvement of pre- and 2-month post-treatment cross-polarized digital images, using an 11-point scale in 10% increments (0 = no improvement, 10 = 100% or complete removal)

RESULTS

- Blinded assessment showed 70%, 77%, 83%, 83%, 26%, and 8% clearance from baseline images for black, green, blue, purple, red and yellow pigments, respectively
- Mild edema and erythema immediately after treatment were common
- No scarring or pigmentary alteration visible in any follow-up images

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/32212171/

Successful treatment of pigmentary disorders in Asians with a novel 730-nm picosecond laser

Lee SJ, Han HS, Hong JK, Park KY, Seo SJ. Lasers Surg Med. 2020 Mar 14.

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730 nm HP
Pigmented Lesions

CASE STUDY 1 DETAILS

- Korean female (age 21 years, Fitzpatrick Skin Type III) with multiple freckles on both cheeks and periorbital area
- Single PicoWay 730 nm picosecond laser treatment with fluence of 1.4 J/cm^2, 3 mm spot size and single pass with minimum overlap
- At 6 weeks post-treatment, independent evaluation of global assessment, by 2 dermatologists, indicated excellent response (75–94% lightening)

CASE STUDY 2 DETAILS

- Korean female (age 49 years, Fitzpatrick Skin Type IV) with freckles, lentigines and erythema on both cheeks and the zygomatic area
- PicoWay 730 nm laser treatment with fluence of 1.7 J/cm^2 and 3 mm spot size on the disseminated freckles and lentigines and 1064 nm laser treatment, with low fluence of 0.6 J/cm^2 and 6 mm spot size for the rest of the face
- At 6 weeks post-treatment, independent evaluation of global assessment, by 2 dermatologists, indicated good response (50–74% lightening)

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/32410249/

A Prospective Study of Fractionated Dual-Wavelength Picosecond Laser in Treating Acne Scars

Yang CS, Huang YL, Cheng CY, Hu S, Chang SL, Lee MC. Lasers Surg Med. 2020 Jan 21.

Resolve Treatment
Acne Scars

STUDY DETAILS

- 18 subjects (10 males, 8 females) with acne scarring, skin phototypes III-IV and mean age 30.8 (range 22 - 45) years underwent 6 Resolve treatments
- At each session: full-face treatment with the Resolve 532 nm handpiece at 0.3–0.5 mJ/µbeam fluence and 5Hz frequency, followed by full-face treatment with the Resolve 1064 nm handpiece at 1.5–1.9 mJ/µbeam fluence and 8Hz frequency. The Resolve 1064 nm handpiece was then applied to areas of scarring with high fluence (2.1–2.5 mJ/µbeam)
- 2 dermatologists assessed outcome using the Goodman and Baron's quantitative global acne scarring grading system (GSS)

RESULTS AT 3 MONTHS POST TREATMENTS

- Significant improvement after the 1st treatment ($p<0.05$) that persisted to the 3-month follow-up
- Subject assessment, using a 5-point Visual Analog Scale, showed improvement from average score of 4.28 at baseline reduced to 2.00 at follow-up
- Transient erythema and swelling, some purpuric spots lasting 2-3 days
- No patient complaints of hyper- or hypo-pigmentation or scarring

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/31960996/

PicoWay® Resolve

Histology of ex vivo skin after treatment with fractionated picosecond Nd:YAG laser in high and low-energy settings

Yeh YT, Peng JH, Peng P. J Cosmet Laser Ther. 2020 Jan 3:1-5.

Resolve Treatment
Histological Evaluation

STUDY DETAILS

- 6 skin samples were taken from clinically normal-looking perilesional areas of East-Asian subjects: 1 biopsy sample was from a female arm (age 36 years, Fitzpatrick Skin Type III) and 5 samples were from a male thigh (age 46 years, Fitzpatrick Skin Type IV)
- After biopsy, 3 skin samples were treated with Resolve 532-nm handpiece (pulse duration 375 ps; fluence of 0.3 or 0.2 mJ/µbeam) and 3 samples with Resolve 1064-nm handpiece (pulse duration 450 ps; fluence of 1.9 or 2.3 mJ/µbeam)
- Samples were examined by a dermatopathologist for intra-epidermal, laser-induced optical breakdowns (LIOBs) and intra-dermal, laser-induced cavitations (LICs)

RESULTS

- Superficial, **intra-epidermal LIOBs were seen in skin treated with higher laser energies**.
- **Deep, intradermal LICs were seen in skin treated at lower energies**
- Lesions were spaced in 600-µm intervals or its multiple
- Lesion sizes and depths were **consistent with previously reported values on Caucasian skin**

https://www.ncbi.nlm.nih.gov/pubmed/31900067

Successful treatment of ephelides in Asian skin using the picosecond 785-nm laser

Chung HJ, McGee JS, Lee SJ. J Cosmet Dermatol. 2019 Dec 20.

785 nm Treatment
Pigmented Lesions

CASE SERIES DETAILS

- 2 **Korean** females (age 29 and 25 years, Fitzpatrick Skin Type III) with **ephelides on the cheeks and/or nose** were treated
- Subjects received a single PicoWay 785-nm laser treatment with Fluence of 1.2 or 1.3 J/cm^2, pulse duration of 300 picoseconds, 3-mm spot size and 1-2 passes, until the end point of slight darkening of the ephelides was reached (without crust formation)

RESULTS

- Patients achieved **appreciable improvement to near complete clearance** of the ephelides without any complications
- **No post-inflammatory hyperpigmentation** observed

PubMed.gov https://www.ncbi.nlm.nih.gov/pubmed/31860149

A 1064-nm Neodymium-doped Yttrium Aluminum Garnet Picosecond Laser for the Treatment of Hyperpigmented Scars

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Koren A, Niv R, Cohen S, Artzi O. Dermatol Surg. 2019 May;45(5):725-729.

Resolve 1064 nm Treatment Hyperpigmented Scars

Case Series Details

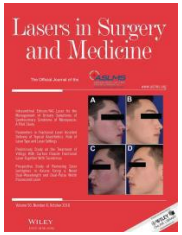
- 16 patients (6 males; 10 females, mean age 33.19 years, Fitzpatrick Skin Type II-VI) with stable non-improving hyperpigmented scars (scar age 18 months to 25 years) were treated
- 4.18 treatments on average (range 3-8), 3-6 weeks apart with the Resolve 1064 nm handpiece, at an energy level of 1.7 to 2.5 mJ/µbeam
- 2 independent dermatologists evaluated improvement at 6 months after the final treatment, using a global assessment scale (GAS) (1=0%-25%, poor improvement to 4=75%-100%, major change/excellent improvement)
- Mexameter quantitative evaluation of scar melanin content before and after laser treatments

RESULTS AT 6-MONTH FOLLOW-UP POST FINAL TREATMENT

- Mean GAS score was 3.31±0.57
- Melanin content decreased by 39.11±11.58% compared to pretreatment values
- Average subject satisfaction rate was high (2.6)
- Tolerance with treatment was good, and there were no significant side effects

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/30882504/

PicoWay® Resolve



Evaluation of the Safety and Efficacy of the Dual Wavelength Picosecond Laser for the Treatment of Benign Pigmented Lesions in Asians

Kung KY, Shek SY, Yeung CK, Chan HH. Lasers Surg Med. 2019 Jan;51:14-22.

PicoWay 532 nm & 1064 nm HPs
Pigmented Lesions

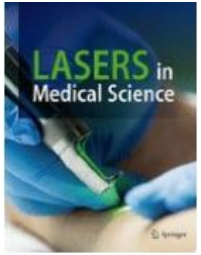
STUDY DETAILS

- 12 female subjects (mean age 47.3 years, range 37-57; Fitzpatrick Skin Types III to IV) with benign pigmentary disorders underwent PicoWay treatments, while 11 subjects completed follow-ups
- PicoWay 532nm and 1064nm treatments at 2 to 6-week intervals
- Blinded evaluation of % clearance using clinical photography
- Follow-ups at 4, 8, and 12 weeks after the last treatment session

RESULTS

- **Over 90% of all pigments achieved good or excellent response (>50% lightening)** at both 1-month and 2-month follow-ups
- Clinical improvement for freckles and lentigines
- Lower rate of PIH induced by picosecond laser is explained by a much more targeted photomechanical and lesser photothermal effects than Q-switched laser

PubMed.gov https://www.ncbi.nlm.nih.gov/pubmed/30357871



Q-switched double frequency Nd:YAG 532-nm nanosecond laser vs. double frequency Nd:YAG 532-nm picosecond laser for the treatment of solar lentigines in Asians

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Vachiramon V, Iamsumang W, Triyangkulsri K. Lasers Med Sci. 2018 Dec;33(9):1941-1947.

PicoWay 532 nm HP
Benign Pigmented Lesions

STUDY DETAILS

- 30 subjects (1 male, 29 females, mean age 62 years, Fitzpatrick Skin Types III-IV) with at least 2 solar lentigines ≥ 5-mm in diameter on the upper extremities were enrolled
- Paired lentigines were treated with PicoWay Zoom 532 nm handpiece (3 mm spot size, energy fluence of 0.3–0.9 J/cm^2 at 1 Hz) and 532 nm nanosecond laser (3 mm spot size, energy fluence of 1.4–1.7 J/cm^2)
- Objective assessment was performed with a colorimeter to measure the luminance score (L*)
- 1 blinded dermatologist assessed degree of pigment clearance on a scale of 0 to 4: 0 = no improvement; 4 = excellent improvement (75–100%)

RESULTS AT 6 AND 12 WEEKS AFTER TREATMENT SERIES

- Both lasers showed significant improvement in mean L* from baseline ($p < 0.001$ for PicoWay)
- At the 12-week follow-up, 19 lesions (67.9%) treated with the PicoWay laser were rated as over 75% pigment clearance
- Patient satisfaction had a significantly higher score of 8.2 (visual analogue scale (VAS) with 0=Not satisfied to 10=Extremely satisfied) with PicoWay treatment compared to 7.1 with nanosecond laser treatment
- 2 lesions (7.1%) from each laser-treated group developed hyperpigmentation at the 12-week follow-up

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/29948457/

Dual Wavelength Treatment Protocol with a Picosecond Laser for the Reduction of Facial Wrinkles

Gold MH. J Cosmet Laser Ther. 2018 Jun 8:1-5. doi: 10.1080/14764172.2018.1481514.

Resolve Treatment Wrinkles

STUDY DETAILS

- 20 subjects (19 females; mean age 55±7 years, Fitzpatrick Skin Types II-IV) with bilateral facial wrinkling (mean Elastosis Score (ES) 5.7±0.9) in the perioral and periorbital regions
- 4 treatments at 1-month intervals with Resolve 1064nm handpiece (2 passes to full face with fluence of 2.3 mJ/µbeam) followed by 2 passes with the Resolve 532nm handpiece (fluence of 0.58 mJ/µbeam) to the full face
- 2 blinded dermatologists reviewed the digital clinical images and assigned a score for the full face, using the Fitzpatrick Wrinkle and Elastosis scale (1=mild elastosis to 9=severe elastosis) at 12 weeks after the 4th treatment

RESULTS AT 12-WEEK FOLLOW-UP AFTER 4TH TREATMENT

- Blinded assessment showed **75% of subjects had at least 1-point improvement**
- Blinded assessment correctly identified 75% (15/20) of the baseline images
- Investigator improvement rate was 100%, with a statistically significant **mean ES improvement of 2.1±0.8 points** compared to baseline assessment ($p<0.001$)
- Transient erythema and edema associated with treatment, resolving within several hours. 1 case of mild purpura and **no pigmentary changes, blistering or scarring**

PubMed.gov https://www.ncbi.nlm.nih.gov/pubmed/29883215

PicoWay® Resolve

A novel titanium sapphire picosecond-domain laser safely and effectively removes purple, blue, and green tattoo inks

Bernstein EF, Bhawalkar J, Schomacker KT. Lasers Surg Med. 2018 May 20.

785 nm Treatment
Green & Blue Tattoos

STUDY DETAILS

- 15 subjects (5 males, 10 females, skin phototypes II–IV, mean age 36 years) with 22 multi-color tattoos, containing black (n=15), blue (n=8), or green (n=13) tattoo ink
- 4 treatments at 6–10 week intervals with 785nm handpiece, 2-4 mm spot size, 3Hz repetition rate, mean 1.4, 2.6, 3.0 and 2.0 J/cm^2 for treatments 1-4, respectively
- 3 blinded physicians reviewed digital clinical images, using a 11-point scale (0=no clearance, to 10=100% or total clearance)

RESULTS AT 8-WEEK FOLLOW-UP AFTER 4TH TREATMENT

- Blinded assessment found 85%, 81%, 74%, 61%, 11%, and 5% clearance from baseline photos for purple, blue, green, black, red, and yellow pigments, respectively
- Typical erythema, edema and one case of pinpoint bleeding. **No hyper-, hypo-pigmentation or scarring**
- The 785nm laser wavelength has special affinity to purple, blue and green tattoo pigments
- In practice, the 1064nm wavelength would be used for black ink, while the 532nm laser would be reserved for yellow and red ink

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/29781161/

Picosecond 532-nm neodymium-doped yttrium aluminum garnet laser-a promising modality for the management of verrucous epidermal nevi

Levi A, Amitai DB, Mimouni D, et al. Lasers Med Sci. 2018 Jan.

PicoWay Treatment
Benign Pigmented Lesions

STUDY DETAILS

- 6 subjects (3 males, 3 females) with skin phototypes I-II with verrucous epidermal nevus (VEN) on the body or face
- 4 of the 6 subjects had been unsuccessfully treated with laser and/or cryotherapy
- 2-6 PicoWay Zoom 532nm treatments, with spot size of 3 mm and fluence of 1.8 J/cm^2 (up to 3 passes) at 8 to 10-week intervals
- 2 blinded dermatologists assessed clinical images at 4 months after the final treatment, using a 5-point scale of 0 (exacerbation) to 4 (76-100% improvement)

RESULTS

- **100% of subjects demonstrated significant improvement** (mean ±3.7 ± 0.45) on the 0-4 scale
- Treatments were well tolerated with minimal complications
- **100% subject satisfaction**
- No residual adverse effects or scarring

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/29299693/

Treatment of acne scarring with a novel dual-wavelength, picosecond-domain laser incorporating a novel holographic beam-splitter

Bernstein E, Schomacker KT, Basilavecchio LD, et al. Lasers Surg Med. 2017 Nov;49(9):796-802.

Resolve Treatment
Acne Scars

STUDY DETAILS

- 19 subjects (3 males, 16 females) with mild-severe facial acne scars (rolling or boxcar), skin phototypes III-V and mean age 45 (range 23 to 70) years treated with Resolve 1064nm handpiece
- 8 subjects (1 male, 7 females) with skin phototypes III-IV and mean age 45 (range 23 to 65) years treated with Resolve 532 nm handpiece
- 4 monthly treatments
- 3 blinded physicians reviewed 81 digital clinical images, using a 10-point scale (1=10% improvement up to 10=100% improvement)

RESULTS

- Blinded assessment **correctly identified 75% of the baseline images**
- **81% of subjects showed improvement**
- **High patient satisfaction**
- Mild and transient erythema and edema associated with treatment, resolving within several hours
- **No hyper- or hypo-pigmentation or scarring**

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/28960395/

Treatment of photoaging with a dual-wavelength, 532 nm and 1,064 nm picosecond-domain laser using a holographic optic

Bernstein E, Schomacker KT, Paranjape AS. J Drugs Dermatol. 2017 Nov 1;16(11):1077-1082.

Resolve Treatment Wrinkles

STUDY DETAILS

- 14 subjects (2 males, 12 females) with mild-moderate wrinkles, skin phototypes I-IV and mean age 45 (range 23 to 70) years treated with Resolve 1064 nm handpiece
- 10 female subjects with skin phototypes II-IV and mean age 45 (range 23 to 65) years treated with Resolve 532 nm handpiece
- 5 treatments with 1064nm & 4 treatments with 532nm
- 3 blinded physicians reviewed 72 digital clinical images, using a 11-point scale (0=no improvement up to 10=100% improvement)

RESULTS

- Blinded assessment **correctly identified 72% of the baseline images**
- **86% of subjects treated with 1064nm** and 80% of subjects treated with 532nm were **satisfied to very satisfied** with outcome
- Mild and transient erythema and edema associated with treatment, resolving within several hours.
- **No hyper- or hypo-pigmentation or scarring**

https://pubmed.ncbi.nlm.nih.gov/29141055/

Picosecond 532-nm neodymium-doped yttrium aluminum garnet laser - a novel and promising modality for the treatment of café-au-lait macules

Artzi O, Mehrabi JN, Koren A, et al. Lasers Med Sci. 2018 May;33(4):693-697.

PicoWay 532 nm Treatment CALMs

STUDY DETAILS

- 16 subjects (5 males, 11 females) with skin phototypes II-IV and mean age 26 years with 1-3 café-au-lait macules (CALMs) present since birth
- 1-4 PicoWay Zoom 532 nm treatments, with spot size of 4–5 mm and fluence of 0.8–1.6 J/cm^2 at 4 to 8-week intervals
- Follow-up at 9 months after the final treatment
- 2 blinded dermatologists assessed clinical images, using a 6-point scale (0 = exacerbated to 5=complete (96–100%) clearance)

RESULTS

- 15 subjects evaluated at 9 months; 1 non-responder dropped from the study
- **All 15 patients demonstrated good to excellent improvement** (mean ±3.76 ± 0.94) on the 0-5 scale
- Treatments were well tolerated with minimal complications
- Only two patients experienced partial recurrence
- **High subject satisfaction and comfort** associated with treatment

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/29098459/

Laser treatment of professional tattoos with a 1064/532-nm dual-wavelength picosecond laser

Kauvar ANB, Keaney TC, Alster T. Dermatol Surg. 2017 Dec;43(12):1434-1440.

PicoWay 532 & 1064 nm HPs Tattoos

STUDY DETAILS

- 60 subjects (23 males, 37 females) with skin phototypes I-VI and mean age 34±11years with 75 professional tattoos
- Up to 10 PicoWay Zoom 532/1064 nm treatments at 6-week intervals
- Blinded assessment of digital clinical images, using a 5-point scale (1=0-24%; 2=25-49%; 3=50-74%; 4=75-95%; 5≥95% clearance)

RESULTS

- Most of the tattoos contained black pigment with 40% having additional red, blue, green or other colored pigments
- **By blinded evaluator consensus, 86% of the treated tattoos** showed at least 50% clearance after 3 treatments (mean clearance score of 3.11)
- By investigator assessment, 70% of tattoos showed at least 75% clearance after 5 treatments
- Treatments were well tolerated with minimal complications
- **High subject satisfaction and comfort** associated with treatment

PubMed.gov https://pubmed.ncbi.nlm.nih.gov/28930792/

Picosecond 532 nm neodymium-doped yttrium aluminum garnet laser for the treatment of solar lentigines in darker Skin Types: safety and efficacy

Guss L, Goldman MP, Wu DC. Dermatol Surg. 2017 Mar;43(3):456-459.

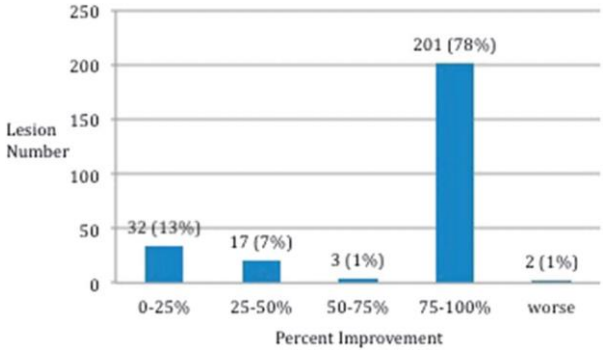
PicoWay 532 nm Treatment Benign Pigmented Lesions

CASE STUDY DETAILS

- 255 discrete pigmentary lesions in 6 Skin Type IV patients (3 women and 3 men) underwent a single treatment with the 532 nm PicoWay Zoom handpiece
- **78% of lesions (201/255) had 75-100% clearance after 1 treatment**
- 2 lentigines (0.8%) worsened because of PIH, both in a patient who admitted to picking the treated area.
- No other cases of PIH or adverse events

TABLE 1. Patient Demographics

Sex	*Skin Type*	*Ethnicity*	*Age*
M	IV	Hispanic	19
M	IV	Chinese	32
F	IV	Chinese	20
F	IV	Hispanic	54
M	IV	Korean	33
F	IV	Vietnamese	30



https://pubmed.ncbi.nlm.nih.gov/27662050/

Successful treatment of a red and black professional tattoo in Skin Type VI with a picosecond dual-wavelength, neodymium-doped yttrium aluminum garnet laser

Friedman DJ. Dermatol Surg. 2016 Sep;42(9):1121-3.

PicoWay Treatment Tattoos

CASE STUDY DETAILS

- A 29-year-old female (of Ethiopian lineage) with Fitzpatrick Skin Type VI was treated for a 9-year-old professional black and red tattoo on the neck
- 3 treatments at 3-week intervals with PicoWay Zoom 1064 nm (black tattoo) and PicoWay Zoom 532 nm (red tattoo) with large spot sizes
- Mild and transient localized edema and erythema in the treatment area immediately after the procedure, which resolved within 24 hours
- No adverse events
- 90% clearance for the red ink and ~75% clearance for the black ink

Figure 1. A 29-year-old woman with Fitzpatrick skin Type VI and a professional black and red tattoo on the neck.

Figure 2. Clinical response was approximately 75% clearance for the black ink and 90% clearance for the red ink, after 3 treatments performed over 1.5 months.

https://www.ncbi.nlm.nih.gov/pubmed/27227473

A novel dual-wavelength, Nd:YAG, picosecond-domain laser safely and effectively removes multicolor tattoos

Bernstein EF, Schomacker KT, Basilavecchio LD, et al. Lasers Surg Med. 2015 July.

PicoWay Treatment Tattoos

STUDY DETAILS

- 21 subjects (Fitzpatrick Skin Type I-IV) with 31 tattoos (black or multi-colored green, blue, purple, red, and yellow)
- Up to 7 treatments with PicoWay Zoom 532 nm/1064 nm handpieces, at 6 to 10-week intervals
- 3-5 mm spot size, 1.4 - 5.3 J/cm^2 fluence with 1064nm wavelength (Black, blue, green, and purple inks), 0.4 to 2.1 J/cm^2 fluence with 532nm wavelength (red and yellow inks)
- Blinded assessment of photos, using 10-point scale (0=no improvement to 10=100% or total clearance)

RESULTS

- Mean score for **blinded evaluation: 7.94±0.09** - corresponding to **79% removal** after an average of 6.5 treatments
- Average **92% clearance of black ink** after an average of 6.5 treatments
- Average **80% clearance of red ink** after an average of 4.5 treatments
- **No scarring, or moderate or severe pigmentary alterations** were seen in the 3-month follow-up cross-polarized images

PubMed.gov https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5034826/

Thank you