Quazar

Diode Module and Driver

Replacement Parts

Laser Supplies

Laser Eyewear

Eyewear # D-213-4600 Each $199.95

Laser Handpiece Replacement

LD50K Laser Module # D-213-6700 Each $799.95

Carbon Dye 200ml

Carbon Dye # P-213-2500 Each $99.95

Laser Tattoo Post Treatment Gel

Stock # P-216-2500 Each $49.99

Laser Capillary Post Treatment Gel

Stock # P-216-2600 Each $49.99

Laser Post Treatment Aloe

Stock # P-216-2700 Each $29.99

Prices are subject to change without notification. To order on-line, go to
http://www.centre-biotechnique-avance.com
For technical assistance beyond what this manual provides, please e-mail
admin1@centre-biotechnique-avance.com
Please allow 24 hours for processing.

Quazar LD50K *produces laser radiation which can be harmful to the eyes. Always wear protective eyewear while operating this equipment. Laser radiation has the capability to burn the skin if the technician does not closely observe the patient's reaction to the procedure. Laser electrolysis results in full destruction of the hair follicle and is* ***irreversible****. Always plan ahead before undertaking detail work such as eyebrow shaping or hairline contouring. Patch test a small area (no larger than 1X1 inch square) before full application. Allow 24 hours to determine the patient's reaction before applying full treatment.*

ESD Handling Precautions: The laser module is extremely sensitive to electrostatic (ESD) discharge. The following steps should be taken to reduce the risk of damage to the diode.

1. Secure the laser accessory to the power system by tightening the exterior shroud (spanner nut) clockwise until it stops. If it is left unsecured, intermittent contact with the leads may produce a damaging power surge.

Always transport (or store) the laser in an ESD protected pouch. Static discharges from the hands can destroy the diode which would not be covered by warranty.

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Printed in UK

Quazar LD50K

Instruction Material for Quazar LD50K
Precision O.E.M. Laser Diode Module and Driver Unit

Quick Setup Guide

Read this guidebook first to set up your equipment for use.

Keep this manual in a convenient place for quick and easy reference at all times.

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Laser Hair Removal

There are currently two standard variations for the permanent removal of unwanted hair by way of laser radiation. The first of which being referred to as laser 'shaving'. The second is 'deep tissue traumatization' which targets living melanocytes or carbon dye in the follicle organ.

Laser shaving has the distinct advantage of showing immediate cosmetic improvement. A new patient may walk into a laser hair removal office covered with unwanted hair then leave hairless and smooth a few hours later. Unfortunately for the patient (who may have spent $5,000 or more for the visit) 95% of their hair will return in about 6 weeks. Progressive permanency has been established at about 5% per treatment with the marginally inefficient 'laser shaving' method. The average investment of treatments (quantitatively) is 10-12 applications before hair growth is permanently halted (providing they are a good candidate for the procedure, see below).

The limitations for achieving permanent results in a prompt and expedient manner by way of laser shaving are many. Most of the laser radiation is absorbed and blocked by the hair *above* the skin. The fraction left over will be reflected and absorbed by the skin itself (especially in cases where the patient has high levels of pigment in the dermis). As little as 10% of the original photon output reaches the papilla matrix to produce thermal damage to the live hair follicle itself.

Laser shaving procedures are covered in this instruction booklet and may be used for those patients who prefer that particular method; however, for the purpose of efficacy and speed for permanent results this manual will focus primarily on the deep tissue traumatization method.

With the deep tissue method, a full 98% of the laser energy is passed through the epidermis (no reaction takes place on or above the surface of the skin). Only 2-5% loss of energy per mm of tissue depth occurs, which leaves very high levels of laser radiation at the precise areas to create thermal damage to the follicle. The deep tissue method requires that the hair be shaved prior to treatment. The hair below the skin will remain as a *target* for the laser energy.

A variation to this procedure requires the follicle organ to be removed from the skin by tweezing or waxing. The empty follicle is then treated with a carbon based dye. The advantages of this 'carbon dye' protocol are substantial. Melanin in human hair is not an efficient receptor for laser energy. Even black hair has only a 20-40% efficiency rating for the conversion of photon energy to heat. Carbon dye has a 99.997% heat exchange conversion ratio. This produces far greater thermal damage to the follicle itself. The next advantage to the carbon dye method is that no hair debris (carbonized hair) is left in the skin. The 'burnt hair' is visible through the skin as a dark spot and is poorly absorbed by the immune system (sometimes taking months to disappear). This can create pimple-like protrusions and, in some cases, infections. The third advantage to using the empty follicle shaft/carbon dye protocol is that laser radiation will not react with blond, red or grey hair growth. There simply is not enough pigment to create heat. By using carbon dye, the entire process becomes controlled, highly efficient, and predictable.

Client Pre-Qualifications

The best candidate for laser hair removal has fair skin with dark terminal hairs. Skin typing for exposure to ultraviolet light can be categorized by the Fitzpatrick classification, developed by Dr. Thomas Fitzpatrick of Harvard Medical School.

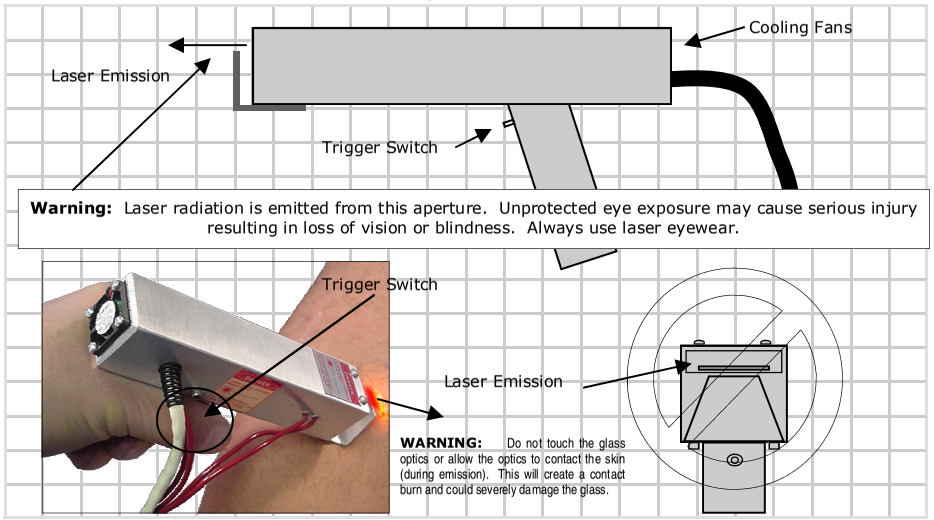
Skin Type I: Never tans, always burns (extremely fair skin, blonde hair, blue/green eyes)
Skin Type II: Occasionally tans, usually burns (fair skin, sandy to brown hair, green/brown eyes)
Skin Type III: Often tans, sometimes burns (medium skin, brown hair, brown eyes)
Skin Type IV: Always tan, never burns (olive skin, brown/black hair, dark brown/black eyes)
Skin Type V: Never burns (dark brown skin, black hair, black eyes)
Skin Type VI: (black skin, black hair, black eyes)

Types 1 through 4 are outstanding candidates. Type 5 will have excellent results as well, but care must be taken to assure that the laser will not burn the skin. Type 6 should not undergo laser hair removal unless used in conjunction with skin bleaching due to the high risk of burning and hypo/hyper pigmentation issues.

References

1. Bjerring P, Cramers M, Egekvist H, Christiansen K, Troilius A. Hair reduction using a new intense pulsed light irradiator and a normal mode ruby laser. J Cutan Laser Ther 2000; 2: 63-71.
2. Kauvar AN. Treatment of pseudofolliculitis with a pulsed infrared laser. Arch Dermatol 2000; 136:1343-6.
3. Eremia S, Li C, Newman N. Laser hair removal with alexandrite versus diode laser using four treatment sessions: 1-year results. Dermatol Surg 2001; 27: 925-9.
4. Gorgu M, Aslan G, Akoz T, Erdogan B. Comparison of alexandrite laser and electrolysis for hair removal. Dermatol Surg 2000; 26:37-41.
5. Bencini PL, Luci A, Galimberti M, Ferranti G. Long-term epilation with long-pulsed neodimium:YAG laser. Dermatol Surg 1999; 25:175-8.
6. Lloyd JR, Mirkov M. Long-term evaluation of the long-pulsed alexandrite laser for the removal of bikini hair at shortened treatment intervals. Dermatol Surg 2000; 26:633-7

LD50K QCW Laser Instrument



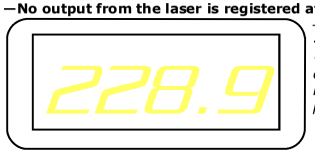
The LD50K comes with a high output 130jcm2/sec. adjustable pulse frequency (fixed pulse duration) instrument for superior operator control. To prolong the life of your diode laser emitters it is advisable to activate the module in short bursts lasting no more than 1 second, while allowing an equal span of time of cooling between pulses. This will prevent overheating and potential damage to the laser crystals. The gallium arsenide laser diodes (emitters) are located inside the hand piece. Dropping or bumping the instrument may result in irreversible damage to the internal components and would not be covered by warranty. Pinching or bending the fiber optic leads that connect the instrument with the driver unit may also damage the laser.

WARNING: Do not operate the laser on full power (setting 5) and full pulse (setting 5) for more than 1 second at a time. The diodes will overheat and may burn out. Failure to comply will void warranty.

Trouble Shooting

Should you encounter technical problems with your Quazar LD50K Laser system, refer to the following guide for potential problems and their solutions.

—Unit is plugged into the wall, all accessories are correctly inserted into the unit but no laser output is being registered.
++Check all connections. Plug and unplug each one being sure all contacts are sound.
++Check all cords. Due to continual bending and fatigue, wires may fray or break resulting is full loss of power.
++Check Fuse: The Quazar unit has a fast-acting fuse mounted inside your unit to protect the delicate laser diode from voltage spikes, on-line power surges and electro-static discharge (ESD damage). Replace with 15 amp fast acting type only. Failure to comply with these specifications may result in serious damage to your laser and will void all warranties.
—Unit clicks or makes noises.
++This clicking sound is normal. No service is required.
—Laser output is weak.
++Emitter output nodules are blocked with carbonized debris (burnt hair etc.). Clean thoroughly with a cotton tipped applicator and alcohol. If the performance of the laser does not improve after cleaning the head your unit needs servicing by a qualified agent. Contact technical support for assistance.
—No output from the laser is registered after all trouble-shooting suggestions listed above have been checked.
++Probable diode failure. Unit needs servicing.
—Output Meter Jumps Up and Down.
++Pulse frequency is set too high for the digital meter to accurately gauge the draw current. This has no serious repercussions for the performance of the system and should be ignored. The accurate values will be given when the laser is not pulsing (in the enabled position).



Digital LED Emission Meter

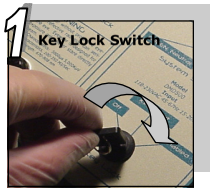
The meter may need re-calibration by adjusting the on-board potentiometer. Two resistors, Ra and Rb may be used in order to alter the full scale reading (F.S.R.) of the meter.

Specification	Min	Typ.	Max.	Unit	Reading	Setting	Jcm2
Accuracy		0.05	0.1	%(+1 count)			
Linearity			+1	count			
Sample rate		3		Samples/sec			
Op. temp	0	50		°C			
Temp. Stbl.		150		Ppm/°C			

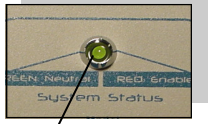
Laser Startup Procedure

Put on your laser eyewear before powering up your system. Wear the eye protection throughout the entire procedure.

1. Turn the key lockout switch from system status green (neutral) to system status red (enabled). At this time your digital power readout will show the available power for the operation of the laser. The emission indicator will need to be converted to joules per centimeter squared/ seconds by using the table on the last page of this pamphlet.



2. Activate the laser pulse (turn to 'enabled'). The red LED will begin to flash which indicated that your laser is 'live'. By pressing the thumb switch on the hand piece you will be delivering pulses of laser radiation. Adjust the pulse frequency to the desired level.
3. Set power level for treatment. It is recommended to start out on setting 4 or 5.
4. Set your pulse frequency to setting 4 (which is ideal for laser epilation).



Red 'Enabled'

Calibration and Measuring Laser Output Fluence

While in pulse mode, the digital meter may not give accurate readings of power output (the pulses can be too fast to measure). For accurate gauging of power you must convert the digital panel meter numbers to joules. A table with your system's certified calibration is included in this booklet.

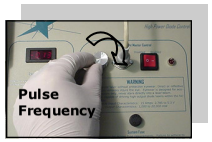
Testing the Laser

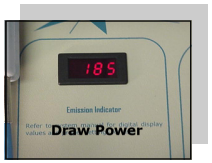
With the power setting on 5, place the laser head on the black test sheet included with your instruction material. Press the trigger switch in pulse mode for a brief duration (1 second or less). A series of brilliant laser flashes will be evident which will ignite the test pad producing vapor and smoke. If no reaction occurs, check power setting.

If you have no laser test sheet you may use a clear balloon with a black marking pen. First inflate the balloon then make a round black mark the size of a quarter. When the laser beam strikes the black mark it will cause the balloon to burst. Should either of these tests result in poor performance of the laser your unit is in need of service.

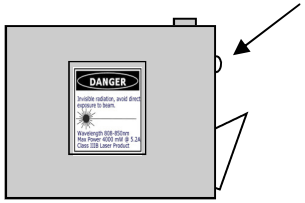
Pulse Mode 5 and Diode Overheating

While using this laser in pulse mode on settings 1-4, there is little chance of overheating (which could lead to diode failure). However; using high power settings (#5) in LP mode may lead to excessive heat build up. Short bursts of 1 second with a 1 second wait before the next emission are best on setting 5. Pushing the laser beyond the limits of performance will damage the gallium arsenide crystals, resulting in loss of intensity, performance, life expectancy of the laser which would not be covered by warranty.



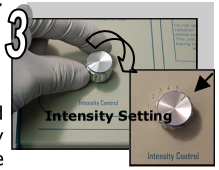


Laser Head Maintenance



Clean the laser head and optics frequently. For light maintenance use acetone or alcohol on a cotton tip applicator. For more aggressive cleaning use an 'Exacto' to scrape any carbonized material from the laser head.

Carbonized debris (residue from vaporized hair) can obstruct the laser treatment by occluding the optics (lens) as well as the articulating arm bracket.



Always use caution when turning on and/or operating this system. The laser is very powerful and can cause serious eye or skin injury if used incorrectly.

Laser Resurfacing

Laser resurfacing is performed using a beam of laser energy which vaporizes the upper layers of damaged skin at specific and controlled levels of penetration. The procedure offers many advantages which others do not have. Unlike *Microdermabrasion*, the laser penetrates deeply into the dermis where promotion of collagen proteins can be stimulated. Chemical peels can be very unpredictable and dangerous while lasers can be dialed in to deliver precisely the right amount of radiation to produce safe and effective results.

All resurfacing treatments work essentially the same way. First, the outer layers of damaged skin are stripped away. Then, as new cells form during the healing process, a smoother, tighter, younger-looking skin surface appears.

For superficial or medium resurfacing, the laser can be limited to the epidermis and papillary dermis. For deeper resurfacing, the upper levels of the reticulas dermis can also be removed. Varied penetration allows treatment of specific spots or wrinkles.

It's also important to consider the length of recovery when choosing among the skin-resurfacing alternatives. In general, the more aggressive the resurfacing procedure is, the more prolonged the recovery is likely to be. "Light" resurfacing procedures, such as superficial chemical peels or superficial laser resurfacing, offer shorter recovery times. However, these lighter procedures may need to be repeated multiple times to achieve results comparable to those achieved with more aggressive techniques.

General Dermatology

Treatment of additional skin afflictions such as Rosacea, Fine Wrinkles, Sun Damaged Skin, Acne Scars, Scars from CO2-laser resurfacing, Age Spots, Large Pores, Acne Prone Skin.

Ideal Distance for Treatment: 1/4 inch from the skin.

Correct Hand Position for Treatments.

As the laser goes over the dermis, vascular spaces with hemoglobin in them absorb the laser energy thereby heating the surrounding tissue and stimulating the fibroblasts to produce type 1 collagen and dermal proteins. The treatment rearranges and/or replaces the solar elastosis in the upper dermis, resulting in NEW collagen formation.

What used to be loose, irregular collagen in the dermis is now tighter, refreshed and rejuvenated.

The benefits of each Diode Laser treatment over all other skin rejuvenation procedures include: Low downtime, non-surgical, little pain and discomfort, immediate results after 1 - 2 treatments, affordable, enhances your own collagen growth, produces more dermal proteins and treats all types of skin.

Treatment Procedure: Resurfacing and Wrinkle Reduction

Deliver 1 second pulses of approximately 130 to 180 joules to each area of 1 cm square. Be very systematic and thorough, but resist the temptation to over treat. Applying more than 180 joules per cm2 may severely burn the skin.

Figure 1 shows normal sagging and wrinkling of the skin which can be expected as humans age. Figure 2 shows excellent improvement on a 47 year old female after 6 treatments.

Apply 'Laser Post Treatment Facial Gel' (see back page of pamphlet for ordering information). This formula contains benzocaine, aloe and glycolic acid, which produces a very mild chemical peel. Call your patient back in for a follow up in 48 hours. Additional treatments may be applied in 2-4 weeks depending on the level of dermal trauma the patient experience and their rate of healing.

Treatment Procedure: Rosacea

Deliver 1 second pulses of approximately 130 joules to each area of 1 cm square. Be very systematic and thorough but resist the temptation to over treat. Applying more than 180 joules per cm2 may severely burn the skin.

Figure 1 shows severe late stage Rosacea of a 70 year old female. Figure 2 shows the substantial improvement achieved with 16 treatments over 18 months. Spider veins and enlarged capillaries require more treatments overall than most other laser procedures.

Apply 'Laser Capillary Gel Post Treatment' (see back page of pamphlet for ordering information). This formula contains activated phylloquinone, which supports healthy regeneration of new capillaries (reducing the recurrence of future Rosacea) by strengthening the capillary walls.

Treatment Procedure: Age Spots

This condition is caused by melanin deposits in the skin which do not fade. Normal melanin will darken (proliferate) with exposure to sun, but will also fade over 4-6 weeks when the exposure is stopped. It is most common in the elderly but occurs in all ages. Laser treatments are remarkably effective for this affliction.

Deliver 1 second pulses of approximately 130 joules to each area of 1 cm square. Fading of the age spots (also known as 'liver spots') will be evident after 4-6 weeks. Figure 3 shows moderate age spot activity on a 67 year old female. Note the improvement in figure 4 showing nearly complete regression of the skin disorder. This patient underwent 6 treatments over 4 months.

Apply the 'Laser Post Treatment Aloe' which contains benzocaine. This will speed healing and reduce any discomfort associated with the laser treatment.

Treatment Procedure: Scars and Lesions

This condition can be caused by any trauma to the skin from acne, sun burn, cuts, scrapes and surgical procedures. To reduce the appearance of the scar, it will be necessary to rebuild the collagen proteins in the skin with laser radiation. This process is extensive (especially in cases where severe scarring exists). It may take 15-20 treatments over 12-24 months to achieve desired results.

Deliver 1 second pulses of approximately 130 joules to each area of 1 cm square. Remember, applying more than 180 joules per cm2 may severely burn the skin.

Figure 5 shows a 28 year old female with acne scarring which was left over from teenage puberty. There are very deep pocks, which are the hardest to improve. In figure 6, the appearance of the scars (including the pock) has improved 90%.

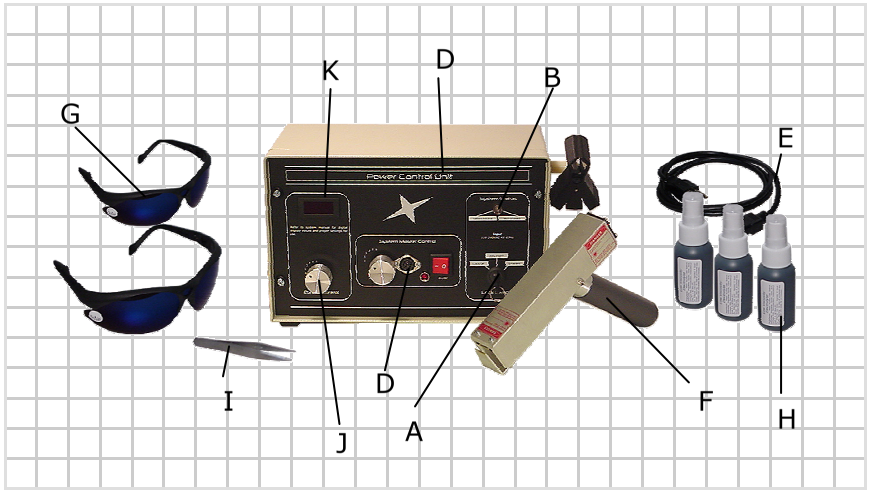
Apply the 'Laser Post Treatment Aloe' which contains benzocaine. This will speed healing and reduce any discomfort associated with the laser treatment.

For a list of laser hair, tattoo, age spot and scar removal as well as general dermatology treatment gel formulations which can aid in the management of discomfort associated with laser treatments, see the back page of this pamphlet.

Treatment around the eyes must be done with adequate protection. Exposure to laser radiation (even through the eye lid) can permanently injure the eyes up to and including blindness.

Photos are for example purposes only and may not indicate results which will be achieved on every patient. Medical laser treatments for dermatology purposes are rated by 'improvement' and not by 'cure'. Many skin conditions such as Rosacea may return and require future treatments to be controlled. Advise your patient to expect improvement but caution them as to which degree of improvement they will be able to achieve.

LD50K Control Locations/Feature Descriptions



A. **Key Lockout:** This feature is required by law on all high-power laser devices. The first step in the correct sequence to power-up your laser is to turn this lock clockwise using the special key included in your kit. The light (center LED lamp) will be green when the power system is off and red when the power system is on.
B. **System Status LED:** This light will indicate system status (neutral or live). Green is neutral and red is live.
C. **Pulse Control:** This allows the operator to set the number of laser pulses per second.
D. **Laser Jack:** An eight-prong coaxial power jack for the diode laser hand piece.
E. **Power Cord:** Rated for 60Hz, 120-240 V, 10 Amp with corresponding plug-style for country of destination.
F. **Laser Instrument:** A single emitter 130jcm2 high intensity pulsed laser with thumb switch.
G. **Eyewear:** This is an essential part of the treatment process. Direct or reflective laser radiation can seriously injure the eye. Both the technician and the patient must use the protective eyewear while the laser is enabled or activated. Eyewear is intended for ***accidental*** exposure only. Never stare directly into a laser beam.
H. **Carbon Dye:** This is an 'atomized' form of molecular carbon which easily penetrates deeply into the follicle shaft. The dye adds pigment which gives a receptor for the photon/heat exchange reaction. The carbon atoms will capture the laser energy and convert it into heat for the rapid and efficient cauterization of tissue for the permanent destruction of the hair follicle organ.
I. **High-Precision Tweezers:** Apparatus for the extraction of follicle prior to carbon dye application.
J. **Intensity Dial:** Control feature for the regulated output of the laser module. Settings range from 0-5.
K. **Emission Indicator:** Panel-mount digital display showing available current. Refer to the last page of this pamphlet for conversion to Jcm2.

Equipment Warranty

We warrant to the original purchaser the equipment manufactured by us to be free from defects in material and workmanship under normal use and service. Our obligation under this warranty shall be limited to the repair or exchange of any part or parts which may prove defective under normal use and service within 12 calendar months from the date of shipment and which our examination shall disclose to our satisfaction to be thus defective. When necessary, purchaser shall apply for a Return Materials Authorization and instructions on proper return procedures from their original sales associate. The laser diode (head) requires special operating precautions which, if defied, may void warranty.

Warranty Extension Certification:

Customer Number Authorization Number

Warranty Extension ( ) years Warranty Type: A B C D

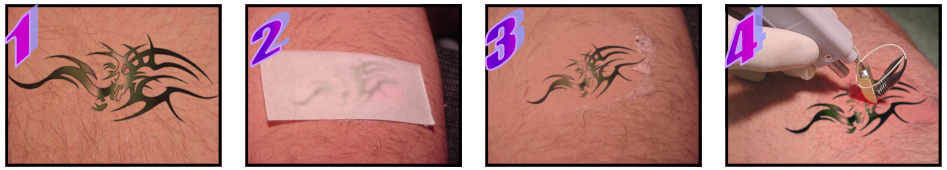
Laser Diode Tattoo Removal

To begin the process it will be necessary for you to scrub the skin over the tattoo with an abrasive applicator. This is will remove the outer layers of the epidermis which will allow for greater penetration of the laser radiation.

Using a depilatory wax or epilation paper, remove all hair from the tattoo area. Hair growth will block some of the laser radiation from entering the tattoo. Follicles in the skin of the tattoo will also be permanently damaged by the radiation which may not be desirable to your patient.

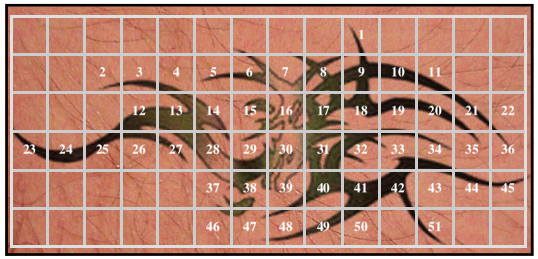
The Treatment Procedure

Carefully power up your laser (see page 4). Dial in full intensity on high pulse frequency. Place the emitter side down (in contact with the skin) on top of the tattoo as shown in figure 4.
Deliver 1/2 to 1 second pulses (approximately 130-180 joules) to each area of 1 cm square (depending on color). Be very systematic and thorough, but resist the temptation to over treat.



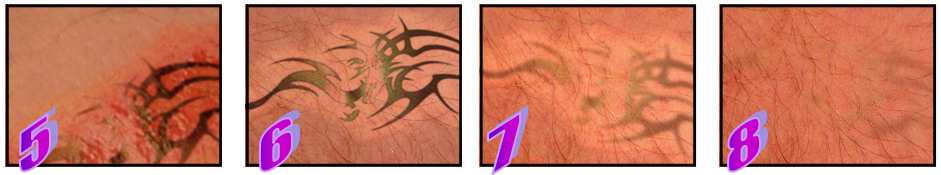
Applying more than 180 joules per cm2 may severely burn the skin. Black ink can be successfully treated with 100 jcm2. Blue and green normally requires 120 jcm2, and red requires up to 180.

The example tattoo at right required 51 pulses of 1 second each for a total of 5,000 joules.



Apply the post treatment cooling gel to the tattoo and allow to dry. This is a very important step which should not be omitted. Although the gel does contain the desensitizing compound benzocaine it will be quite common for the patient to feel some burning in the minutes and hours following the procedure. This is quite normal. If the patient requests extra relief, apply a cold pack as needed.

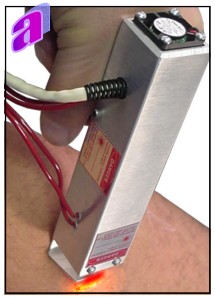
In picture number 5, you can see some of the redness, swelling and scabbing which may show up 1-3 days following treatment. In picture number 6 and 7, you can see some fading of the tattoo, but also a mild form of hypo pigmentation (loss of the patient's natural skin color). This condition is temporary and will subside as the melanin regenerates with natural healing.
In picture number 7, you can see that the tattoo has faded to a point where it is not recognizable. This particular tattoo required 6 treatments over 7 months. It is always a good idea to take pictures of your patient's treatment areas to show them the steady improvement. This will help them to stay committed and motivated as the process requires a substantial investment of time.



Patient Group	*Treatment Area*	*Tattoo Clearance (Average)*	*Notes*
2 Patients Black Ink Only	*Arms*	*90% after 3 mos.*	*5 treatment average*
5 Patients Blue and Black Ink	*Torso*	*90% after 3 - 12 mos.*	*8 treatment average*

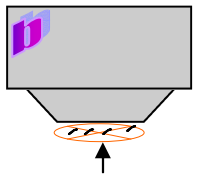
Always Patch Test Your Client First

Before administering full treatment to any patient you must do a patch test. The best time is during their initial consultation. Apply 3 pulses on setting 5 to a single area (stationary exposure). To apply single pulses set your pulse frequency on 1. If this test burns the patient (distinct swelling and trauma to the skin will show) they are not suitable for laser epilation or laser procedures of any kind. This is generally a condition of persons who have black skin (Fitzpatrick level 5 and 6).



Treatment Variation 1: Deep Trauma on Shaved Hair

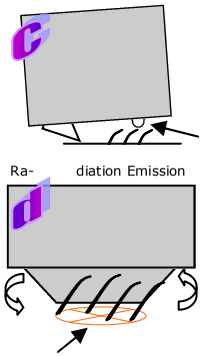
With this procedure, the hair is actually shaved by a razor prior to laser application. This leaves the follicle intact, which provides a target for the laser radiation. The skin must be thoroughly cleaned to allow for nearly 100% of the radiation to be sent deeply inside the tissue. If there is dirt, hair, or dead skin, the laser radiation may become blocked, thereby reducing the efficiency of the device.



Place the laser head on the skin as shown in figure 'a' (with the brass focal tip touching the treatment area). Activate the laser on pulse setting 4 (7 pulses per second) while intensity is set at 5. Scan the treatment area at a rate of 1/2 inch per second.

Laser Treatment Procedure 2: Laser Shaving

To shave the skin with a high power laser, trim the hair to 1/4 inch or so. If the hair is too long it will create debris which will block and obstruct the emission output resulting in loss of photon intensity. Should vaporized hair build up on the laser head, use isopropyl alcohol on a cotton swab to clear.

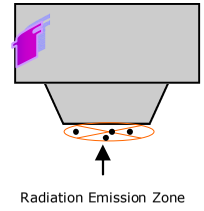


Place the laser head on the skin as shown to the left in figures 'b' and 'c' and 'd'. The brass tip should be in contact with the skin and the hand piece should be at a 85 degree angle to the surface. Activate the laser on pulse setting 4 (7 pulses per second) while intensity is set at 5. Scan the treatment area at a rate of 1/2 inch per second. This procedure works well on coarse dark hair growth. Finer and lighter hair may not completely vaporize from the laser. In these cases, the use of carbon dye on the hair (or a dark hair dye) will improve the heat exchange reaction.

Treatment Variation 3: Deep Trauma by Carbon Dye

Before applying treatment, remove all hair from the area by tweezing or waxing. Refer to pictures 1-5 below for proper technique for waxing and carbon dye application.

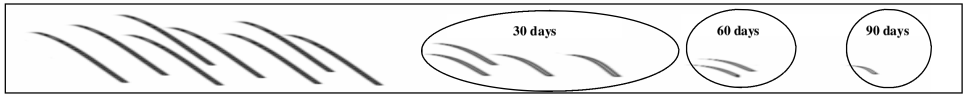
Laser hair removal is most effective when applied to an empty follicle shaft. Human hair simply does not normally have enough pigment to allow for sufficient heat exchange to cauterize, desiccate and necrotize the cells which produce hair. To compensate for this lack of 'quantitative' and 'qualitative' photon targets, it will be necessary to place a high-density carbon dye inside the follicle prior to treatment.
Using a cotton-tipped applicator, completely cover the treatment area with the special dye included in your kit. Massage the dye into the follicle pore with a firm downward circular motion. Repeat 2-



3 times to saturate the follicle pore. Use an ***ethyl alcohol*** based wipe to lightly clean the excess from the surface of the skin. At this point you will have all desired follicles ***visibly highlighted*** with a dark spot (as seen above) and are ready to power up your laser for treatment.
Place the laser head on the skin as shown in figure (with the focal arm touching the treatment area). Activate the laser on pulse setting 4 (7 pulses per second) while intensity is set at 5. Scan the treatment area at a rate of 1/2 inch per second. Move the laser and repeat.

Treatment Efficacy

Permanent hair removal is a gradual process which takes 90 days or more for complete destruction of the follicle tissues. Each hair must go through its entire growth cycle for it to be effectively treated. Generally, it is only during the ***early anagen*** phase that it is vulnerable to destruction. The following chart will give you an accurate example of what the reduction in growth activity should look like from 30, 60 , and 90 days of treatments.



Important Considerations for Safe Laser Hair Removal Treatment

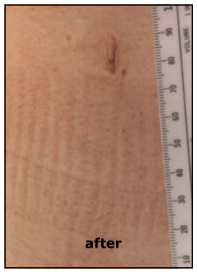
Treatment Around or Near the Eyes: Great care must be exercised when working near the eyes. The laser emission is powerful enough to actually penetrate the eyelid and permanently damage the eye. Having the patient close their eyes is not satisfactory protection. The use of a dark-colored damp wash cloth which is folded over four times will deflect the harmful radiation; however, only laser protective eyewear is recommended.

Treatment Around or Near Mucus Membranes: Laser radiation will severely damage the tissues inside the nose and ear canal. Treatment should be avoided in these areas altogether.

Treatment Around or Near the Genitals: Laser hair removal is safe for application to the pubic regions including the reproductive organs of both sexes. Care must be taken into consideration in these areas due to the increased level of neural sensitivity. The patient may find the process uncomfortable without a topical desensitizing spray.

Treatment Around or Near the Areola (nipple): Laser hair removal is safe and effective on hair growth which occurs from the areola of both sexes.

Post-Treatment: The skin surrounding the treatment area will experience short-term erythmia (reddening) which will subside within 12-24 hours. Should the treatment area show signs of excess scabbing you may wish to reduce the overall treatment time or intensity. The application of a post-treatment cooling and healing gel (such as Aloe) is encouraged to speed healing and reduce sensitivity. Instruct the patient to refrain from applying cosmetics or sunbathing for at least 24 hours.



Over Treatment: Each laser pulse sends photon 'bundles' deep into the skin where it damages the hair follicle tissues. This laser radiation also will have mild effects on capillaries and skin tissue. If too many laser pulses are administered the capillary network will begin to break down. This will create a bruise which will take several days to subside. Although the use of lasers to destroy capillaries in the skin is quite common (for spider veins, port wine stains, birth marks etc), it is not the intent of this treatment as outlined for hair removal to damage other tissues. For that reason the technician should carefully test and document how many laser pulses each patient can withstand before capillary breakdown (bruising) occurs. The general rule of thumb is to patch test the skin with 3 pulses (on full power) then send the patient home. Have them back in the office in 24 hours to observe the reaction. If there is no burning or bruising, administer the full treatment. It is not recommended to deliver more than 20 pulses to one stationary area at a time. If more than 10 pulses are delivered the technician should make a small circular motion with the laser head to avoid sending all the energy through the exact same entry points.

This laser can cause serious burns to the skin. All technicians should adopt the 'less is more' philosophy. It is far safer to have the patient come back for additional treatments than to administer too much radiation in one session resulting in tissue trauma and blistering.

Patient #	hair counts			12 week clearance
1 females, 2 males	pre	post	number of treatments	percent
#1: laser shave procedure	274	9	12	97%
#2: deep tissue with hair	327	19	8	94%
#3: deep tissue with dye	187	2	6	99%

Emitting wavelength	*(810 ± 10) nm*	*Classification: IV*	***Fluence***	*130J/cm2 max*
Output power	*User-adjustable 0 to 130 Joules*	*Designation: OEM*	***Energy Instability***	*19% maximum*
Generation modes	*LP/CW*	*Manufacturer: Quazar Industries, UK*	***Safety goggles***	*OD 8.0 @ 700-1000nm @ 2W CW (minimum) suggested.*
Beam characteristic	*Semiconductor Diode*	*Warranty: 1 Year*	***Electrical requirements***	*100/120 VAC, 50/60 Hz nominal, 1.0 A max. 220 or 240 VAC, 50/60 Hz nominal, 1.2 A max.*
Pulse duration	*Manual Adjust*	*Emission Indicator: Yes*	***Ambient operating temperature***	*10°C to 30°C*
Weight	*15 kg max*	*Key Lock: Yes*	***Ambient storage temperature***	*-25°C to 70°C*
Optics	*None*	*Beam Shutter: No*		
Dimensions	*170 x 500 x 370 mm*	*21CFR 1040, IEC 825-1:1993: No*		

Laser Diode Tattoo Removal

Nearly 1/2 of all people with tattoos eventually want them removed. Until recently these people had no viable (and safe) options available to them. In the mid 1980's lasers had been used experimentally to remove the pigment with encouraging success rates. By the 90's they were producing very consistent and reliable results. Surprisingly, lasers do not actually burn the ink out; they fracture it into tiny pieces which are then removed from the skin by your immune system.

On average, professional tattoos require 5-6 treatments, while amateur tattoos may require 3-4 treatments, spaced approximately 2-4 weeks apart. The number of treatments depends on the amount and type of ink used and the depth of the ink in the skin. Occasionally technicians have needed to treat a tattoo 10-20 times.

What should I charge for the procedure? The fee depends on the size of each tattoo, and how many treatments it takes to lighten or remove it to your satisfaction. Each tattoo treatment generally costs $135 for the 1st square inch and $25 for each additional inch. If more than one tattoo is being treated at the same time, you may offer pricing alternatives. A consultation fee of $40-$60 should be assessed for this quote.

What will the treatment be like? It is less painful to have a tattoo removed than getting it put on. A numbing cream should be applied an hour or two before the procedure. After the procedure the treated area may blister, swell, crust, scab, or bleed slightly. Care for the treated area daily in order to prevent infection and to get the best possible healing results. The tattoo will then gradually fade for 2-4 weeks when it can be treated again. You may see additional fading for as long as several months so you can space the treatments farther apart but not closer than 2 weeks.

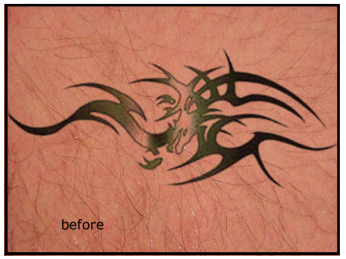
Important Considerations for Safe Laser Tattoo Treatment

Treatment on Skin with Hair Growth: One of the major side effects of diode laser tattoo removal is destruction of hair follicles. If your client would like a tattoo removed from an area in which there is wanted hair growth, manually extract all follicles before treatment. The use of an aggressive depilatory wax is best. If the follicle is removed there will be far less damage to the papilla cells which produce growth. The hair follicle unit will regenerate in 4-6 weeks.

Treatment Around or Near the Genitals: Laser tattoo removal is safe for application to the pubic regions including the reproductive organs of both sexes. Care must be taken into consideration in these areas due to the increased level of neural sensitivity. The patient may find the process uncomfortable without a topical desensitizing spray.

Treatment Around or Near the Eyes: Great care must be exercised when working near the eyes. The laser emission is powerful enough to actually penetrate the eyelid and permanently damage the eye. Having the patient close their eyes is not satisfactory protection. The use of a dark-colored damp wash cloth which is folded over four times will deflect the harmful radiation; however, only laser protective eyewear is recommended.

Post-Treatment: The skin surrounding the treatment area will experience short-term erythmia (reddening) which will subside within 12-24 hours. Should the treatment area show signs of excess scabbing you may wish to reduce the overall treatment time or intensity. The application of a post-treatment cooling and healing gel (such as Aloe) is encouraged to speed healing and reduce sensitivity. Instruct the patient to refrain from applying cosmetics or sunbathing for at least 24 hours.



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Nestor, Mark S., MD, PhD, "Laser Hair Removal: Clinical Results and Practical Applications of Selective Photothermolysis", Skin & Aging, January 1998.
Lask, Gary, MD, Elman, Monica, MD, Slatkine, Michael, PhD, Waldman, Amir, PhD, Rozenberg, Zvi, PhD, "Laser-Assisted Hair Removal by Selective Photothermolysis: Preliminary Results", the American Society for Dermatology Surgery, 1997.

—Black ink absorbs all wavelengths of light and responds very well to diode laser treatments.
—Green and Blue ink absorbs 670-890nm light best and responds very well to diode laser treatments.
—Red, Orange, and Purple inks absorb 500-700nm light best and will only show marginal improvement with diode laser treatments.
—Turquoise responds variably, depending on the pigments in the ink.
—Yellow tends to reflect light and does not respond well to diode laser treatments.