

K-LASER THERAPY

APPLICATIONS AND GUIDELINES

FOR THE TREATMENT OF

DIABETIC AND

PRESSURE ULCERS



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SPECIFIC TO K-CUBE4™ THERAPEUTIC LASER

- **Please have the K-Laser Operator Manual, the Safety Manual and the Little Red Book with you when operating the device.**
Only persons who are authorised and adequately trained may operate the device.
- **Laser treatment can only be applied directly over the skin. Please clean the wound and the skin prior to laser treatment.**
- **When applying the laser treatment over the wound, keep the handpiece at a distance of approximately 2cm / 1in from the wound.**
Treatment can be delivered in contact mode when treating the lower limb during CW phase.
- **Do not go over the wound whilst in CW phase. Only pulsed phases should be applied to the wound.**
- **Laser treatment is usually painless.**
In very rare occasions some discomfort may be perceived during or after the treatment: it normally fades away on its own and usually stops occurring altogether after 2-3 laser sessions.
If **intense** discomfort is perceived during the first treatment, reduce Power and Time(*) by 50%. If tolerated well after 2-3 session return back to standard protocol setting for remaining laser course sessions.
If **intense** discomfort reoccurs despite reduction of Power and Time, discharge the patient and report to the consultant.
- **Review the patient after the 6th session, or for very chronic cases after the 8th session, to assess the wound and determine future protocol setting and number of sessions required.**
- **When adjusting a protocol, allow 2-3 sessions before making further adjustments, as the effects of a new setting may take a few days before becoming evident.**
- **Ideally K-Laser treatments should be applied 3 times on the first week (or 2+ weeks for very slow healers), and 2 times a week for the following sessions.** However 1 session a week would still be beneficial in most cases.

- On very chronic / unresponsive wounds, follow the modality below:
 - 1) apply the pulsed phases over the wound first.
 - 2) Apply the CW phase over the leg as per diagram.
 - 3) Apply the pulsed phases over the wound again.

- In the treatment of wounds, K-Laser therapy can be used as sole treatment, but effects will be more substantial if used in conjunction with other treatment modalities.
Laser therapy should be the first treatment to be applied after wound cleaning or debridement; any other topical treatment must be applied AFTER laser treatment. Off-loading is necessary in case of pressure ulcers.

- **In case of very dense and dark tattoos over a treatment area, reduce the Power by 1 Watt or more, accordingly with the patients' sensitivity. Ask the patient if the treatment feels comfortable.**

- When treating patients with **metal implants**, K-Laser is a safe modality to use and will not alter or damage the tissues or implants. If treating a patient with **metal plate implant** ensure the laser is directed from the contralateral side. Laser light will not penetrate through the metal implant but would increase laser light exposure to the superficial tissues above the plate itself.

*** How to increase or reduce Power or Time**

(Current setting) + n% = new setting.

Example:

6 Watts + 25%

6 + 25 % = 7.5

OR: $6 \times 25 : 100 = 1.5$ $6 + 1.5 = 7.5$

**** How to adjust the additional protocols to different body sizes**

The CW phase of the lower limb / foot protocols are based on an average body size (ENDO).

- For ECTO body size (small): decrease Time of CW phase by 25%
- For MESO body size (large): increase Time of CW phase by 25%

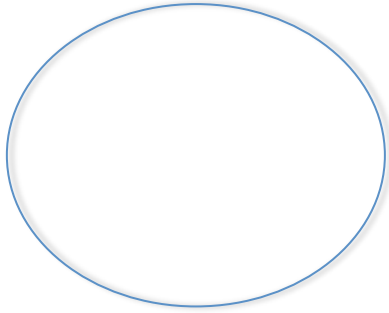
TREATMENT SCHEDULE AND INDICATIONS

PERIOD	INDICATIONS
Week 1	<p>Select the appropriate wound protocol accordingly with wound size and location. If necessary adjust the protocol to body size**.</p> <p><u>1st Phase (CW): over the leg and around the wound.</u> Zoom on 5. Pace: 2cm / 1 inch per 2 seconds. Move the probe from the posterior knee down to the wound area, avoiding the wound itself, following the main blood and lymphatic vessels. ADJUST TO THE PATIENT'S SENSITIVITY: IF the patient can not tolerate the heat/stimulation then reduce the Power by 1Watt.</p> <p><u>Pulsed phases: over the wound.</u> Zoom on 5. Pace: 2cm / 1 inch per second. During each of the 10 pulsed phases, uniformly paint the entire wound PLUS 2.5cm/ 1 inch margin on all edges of the wound.</p> <p>Three sessions should be delivered during the first week.</p>
Week 2	Repeat as above, or bring down to 2 sessions a week if a positive response is evident.
Week 3	<ul style="list-style-type: none"> - IF there is no improvement, perform the pulsed phases twice: before and after the CW phase. - IF the wound is improving, then just repeat as above.
Week 4 and 5	Repeat as above.
Week 6 and following	<p>IF the wound is not improving, use the protocol for a larger wound: i.e. use a 40cm² protocol on a 20 cm² wound.</p> <p>Carry on treating until you are sure you have reached a plateau.</p> <p>Wounds that are over 1 year old may take over 2-3 months of laser treatments to heal. Regular assessments should be performed over the period.</p>

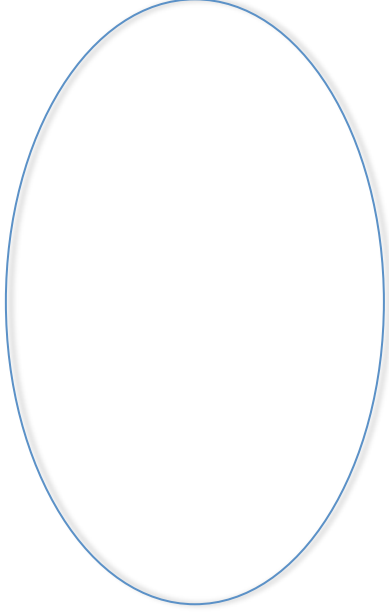
HOW TO CALCULATE THE K-LASER WOUND SIZE PROTOCOL

The laser treatment area is the wound area plus 2.5 cm / 1 in margin on all edges of the wound. Therefore:

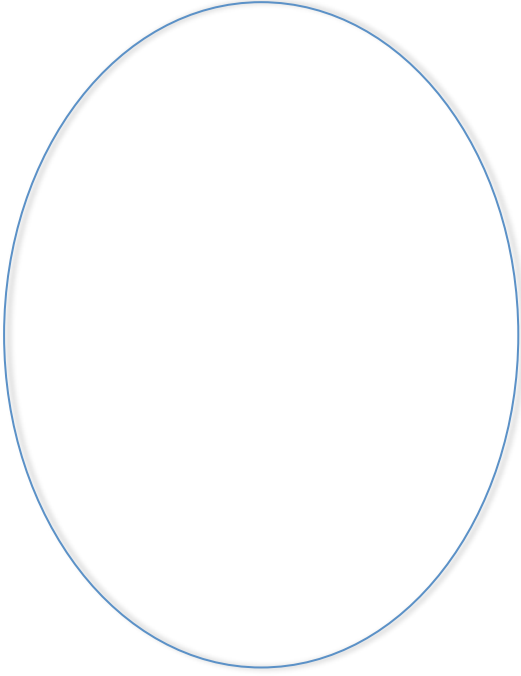
$$(\text{LENGTH} + 2.5) \times (\text{WIDTH} + 2.5) = \text{LASER TREATMENT AREA} = \text{SIZE PROTOCOL}$$



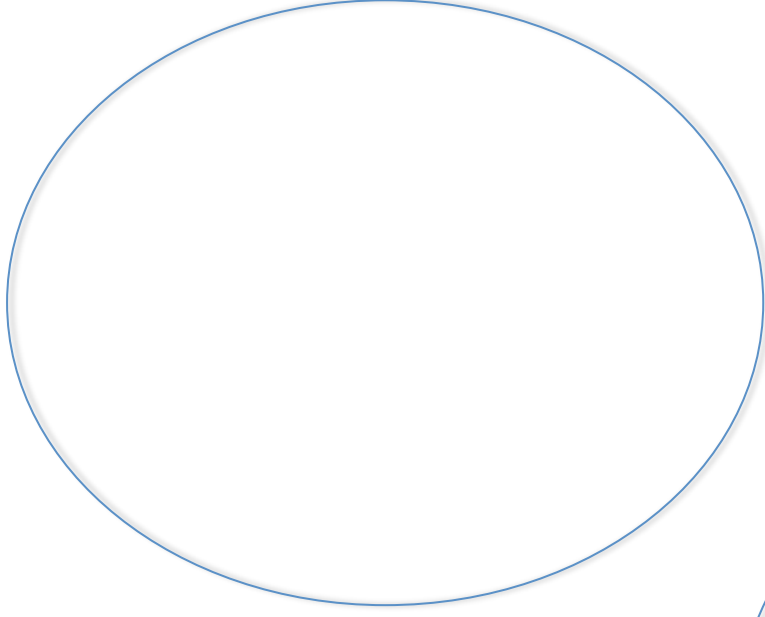
20 cm² / 3 in²



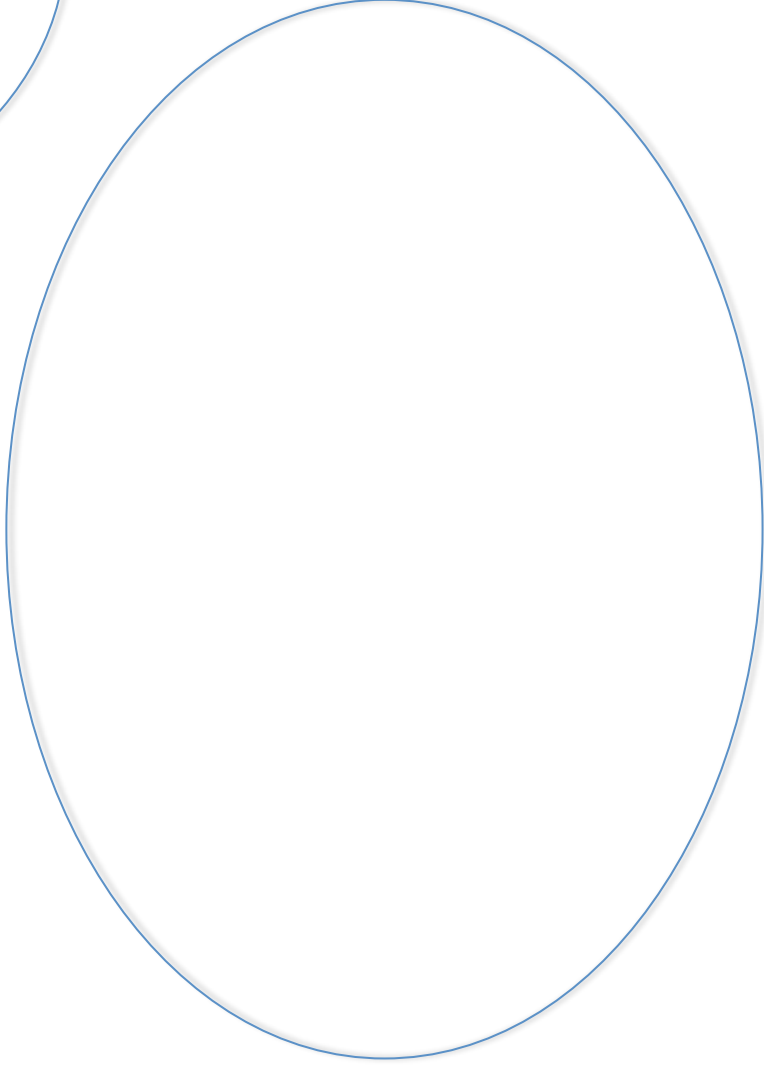
40 cm² / 6 in²



60 cm² / 9 in²



80 cm² / 12 in²

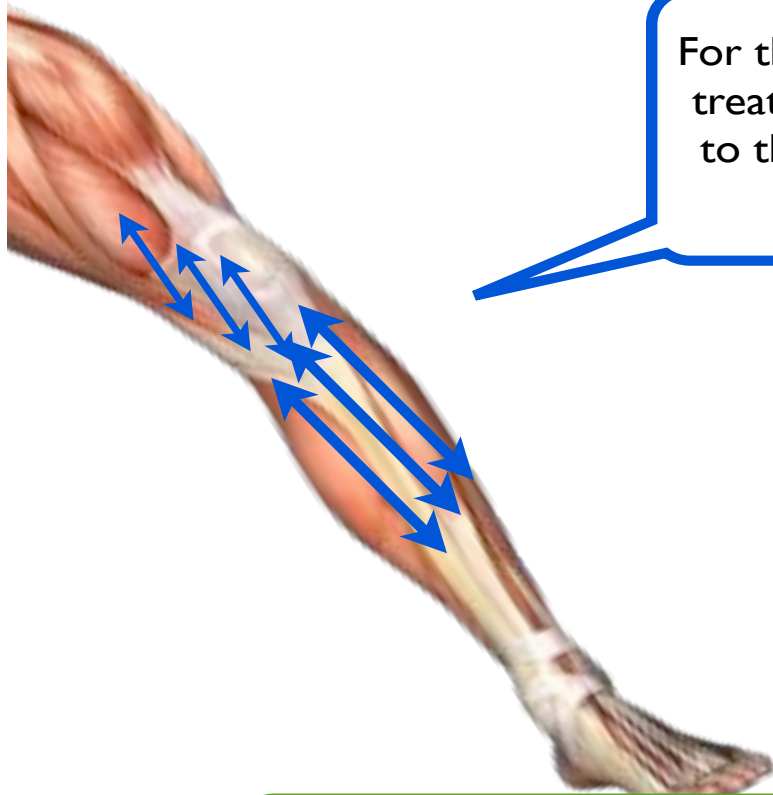


140 cm² / 21 in²

KLASER™_{USA} Treatment Map

Diabetic Ulcer

(Foot)



For the **first** phase (CW: first 6 minutes) treat the from the posterior knee down to the medial ankle, covering the entire area **several** times uniformly.

Patient should occasionally attempt to flex/extend the foot while in CW mode.

Then during each of the next **TEN** phases, uniformly paint the entire wound **PLUS** an inch margin on all edges of the wound.



Wound Volume

Treatment Volume

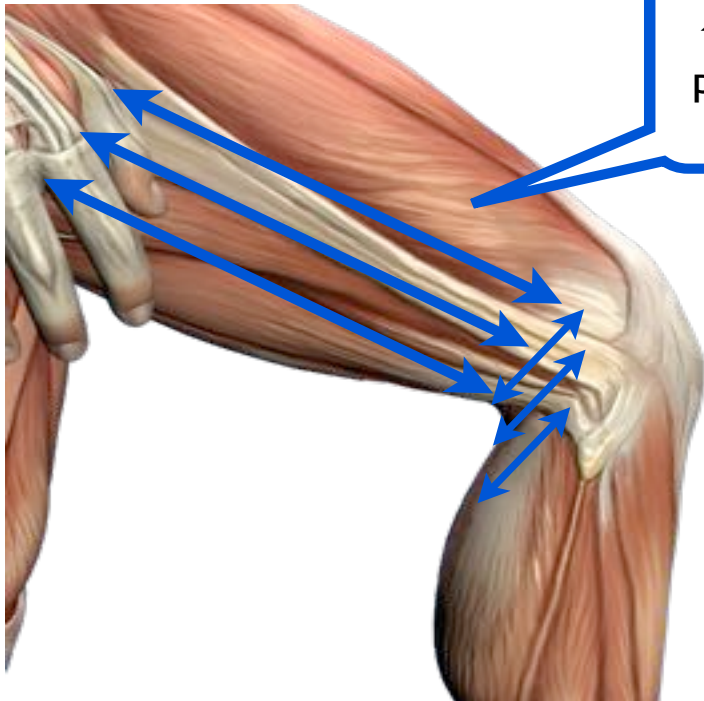
KLASER™ *Treatment Map*

Diabetic Ulcer

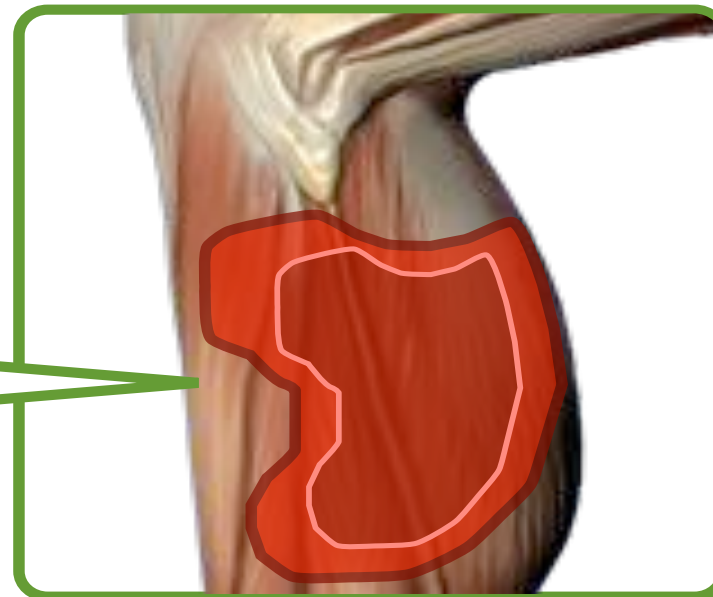
(Lower Limb)

For the **first** phase (CW: first 8 minutes) treat the femoral artery following from the groin down the medial thigh to the posterior knee, covering the entire area **several** times uniformly.

Patient should occasionally attempt to flex/extend the foot while in CW mode.



Then during each of the next **TEN** phases, uniformly paint the entire wound **PLUS** an inch margin on all edges of the wound.



Wound Volume

Treatment Volume

Pressure and Neuro-Ischaemic Recurrent Ulcer

- 66 year old male patient.
- Diabetes Type II.
- Smoker.
- Recurrent pressure ulcers: average healing time 6 weeks.

Wound treatments:

- Both ulcers: SFC plantar pad and sterile gauze
- Right foot 3rd MTPJ wound was treated with K-Laser once weekly
- Left foot 3rd MTPJ wound used as a control



15th August 2013



29th August 2013



The ulcer on the Right foot, treated with K-Laser in 3 sessions, healed in 2 weeks (usual healing time 6 weeks).

The control ulcer on the Left foot, conventionally treated, grew in size over the same period of time.

Amputation of Left Hallux and Second Toe

- Amputation on the 8th of March 2013
- 82 year old patient
- Diabetes Type II, HBA1C 10.5%
- Wound was healing but in the second half of April stopped progressing and became unresponsive to treatments.
- Swab results: heavy mixed growth including coliforms

Wound treatments:

- Maggots
- Medical Honey
- Algiste and TTA
- Silver dressing
- Collagen granules
- New post-op DH walker shoes
- 7th June 2013: 1 K-Laser Tx per week (4 sessions not attended during July) added to standard wound management.



7th June 2013
9 x 5cm
First K-Laser session.



4th September 2013
4 x 1.5cm
Last K-Laser session.

The wound was completely
healed by October 2013



A Pilot Study to Evaluate the Efficacy of Class IV Lasers on Nonhealing Neuroischemic Diabetic Foot Ulcers in Patients With Type 2 Diabetes

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Diabetic foot ulcers (DFUs) represent a disabling complication of diabetes that has a devastating impact on the quality of life and predict lower-limb amputation and premature mortality (1). Despite best practice, 30–40% of DFUs do not heal within 12–20 weeks (2). Novel therapeutic agents have been tested in clinical trials, and it has been estimated that ~30–50% of patients with neuropathic DFUs receiving these new treatments have healed by 12–20 weeks (3). Laser therapy, delivered with devices emitting one or two wavelengths, has been reported as an adjunctive procedure that promotes the healing of chronic diabetic wounds by increasing the blood flow and the release of growth factors and by reducing the inflammation (4).

In this pilot study, we have been the first to investigate the efficacy of an advanced class IV laser (emitting four wavelengths) on Wagner stage 1 and 2 neuroischemic DFUs of five patients with type 2 diabetes who were nonresponsive to conventional treatment for at least 12 weeks. Laser treatment was delivered once a week prior to standard care and dressing. As a control we selected patients with similar DFUs and clinical characteristics treated within our department with standard care. In the laser-treated group, age was 58.2 ± 3.6 years (mean \pm SEM; range 47–66) and mean duration of diabetes was 20.4 ± 2.1 years.

At the time of enrollment, glycosylated hemoglobin (HbA_{1c}) was $9.0 \pm 0.8\%$ (74.6 ± 8.4 mmol/mol). All laser-treated patients had preserved renal function (estimated glomerular filtration rate [eGFR] 72 ± 8.3 mL/min/1.73 m²) and moderate to severe peripheral artery disease, defined as 20–49% and 50–99% diameter reduction in at least one of the arterial segments from aorto-iliac to popliteal segments on an arterial duplex scan. The mean size of the ulcers was 2.4 ± 1.0 cm². The control group of six patients with type 2 diabetes received standard care and had similar ulcer duration and size; comparable glycemic control, age, diabetes duration, and eGFR; and similar degree of peripheral artery disease (Table 1). Standard care for DFUs, including antibiotic treatment, dressing, and off-loading, was similar in both groups. Within the 12-week follow-up, four of five laser-treated patients (80%) had a complete ulcer resolution (most ulcers healed after 4.6 weeks). In the control group, no ulcer healing occurred by week 12.

A limited number of small clinical trials and case studies evaluating the effects of laser devices with lower power and one or two wavelengths on DFUs have previously reported positive outcomes (4). However, because of the heterogeneity in the methodology, findings from these studies have not been consistent. The laser used in this pilot study is the first example of a high-

powered device with four wavelengths concomitantly acting on multiple metabolic processes that accelerate the wound healing: stimulation of cytochrome-C oxidase, an increase in angiogenesis, and improvement in blood perfusion (5).

Taking into consideration the limitations of this proof-of-concept study, our findings indicate that laser therapy delivered by a class IV laser can significantly impact the healing process of neuroischemic DFUs refractory to standard treatment. Randomized controlled clinical trials with this new laser device in larger populations are required to confirm our results.

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K-LaserUSA had no role in the design, data analysis, or preparation of the manuscript.

Duality of Interest. No potential conflicts of interest relevant to this article were reported.

Author Contributions. G.M. managed the patients, researched the data, and wrote the manuscript. J.K. and L.G. reviewed the manuscript and contributed to the discussion. H.R., T.A., and A.L. delivered foot care and administered laser therapy. G.M. is the guarantor of this work and, as such, had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

References

1. Boulton AJ, Vileikyte L, Ragnarson-Tennvall G, Apelqvist J. The global burden of

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Table 1—Patient characteristics and study outcomes

	Laser + standard treatment	Standard treatment
<i>n</i>	5	6
Sex (male/female)	5/0	5/1
Age (years)	58.2 ± 3.6	63.2 ± 5.1
Duration of diabetes (years)	20.4 ± 2.1	13.8 ± 3.0
HbA _{1c} [% (mmol/mol)]	9.0 ± 0.8 (74.6 ± 8.4)	8.1 ± 0.9 (65.2 ± 10.3)
eGFR (mL/min/1.73 m ²)	72 ± 8.3	65.2 ± 10.3
Duration of ulcers (weeks)	18 ± 2.3	17.3 ± 1.2
Ulcer area (cm ²)	2.4 ± 1.0	2.2 ± 0.5
Patients with complete healing in <12 weeks	4/5	0/6

Data are *n* or mean ± SEM.

diabetic foot disease. *Lancet* 2005;366:1719–1724

2. Ince P, Game FL, Jeffcoate WJ. Rate of healing of neuropathic ulcers of the foot in diabetes and its relationship to ulcer duration and ulcer area. *Diabetes Care* 2007;30:660–663

3. Margolis DJ, Allen-Taylor L, Hoffstad O, Berlin JA. Diabetic neuropathic foot ulcers: the association of wound size, wound duration, and wound grade on healing. *Diabetes Care* 2002;25:1835–1839

4. Beckmann KH, Meyer-Hamme G, Schröder S. Low level laser therapy for the treatment of diabetic foot ulcers: a critical survey. *Evid Based Complement Alternat Med* 2014;2014:626127

5. Vladimirov YA, Osipov AN, Klebanov GI. Photobiological principles of therapeutic applications of laser radiation. *Biochemistry (Mosc)* 2004;69:81–90

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Diabetic Foot Ulcer 5-20 cm2 / 1-3 in2								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	360	8	8	CW	CW	2880	** Treat the from the posterior knee down to the medial ankle, covering the entire area several times uniformly.
2	660+800+905+970	5	6	3	Hz	500	15	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	5	6	3	Hz	1000	15	
4	660+800+905+970	5	6	3	Hz	2000	15	
5	660+800+905+970	5	6	3	Hz	5000	15	
6	660+800+905+970	5	6	3	Hz	10000	15	
7	660+800+905+970	5	6	3	Hz	15000	15	
8	660+800+905+970	5	6	3	Hz	20000	15	
9	660+800+905+970	5	6	3	Hz	10000	15	
10	660+800+905+970	5	6	3	Hz	5000	15	
11	660+800+905+970	5	6	3	Hz	1000	15	
410 seconds 6:50 minutes			Totals			Wound Dose (J) 150	Total Dose (J) 3030	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Diabetic Foot Ulcer 21-40 cm² / 3.1- 6 in²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	360	8	8	CW	CW	2880	** Treat the from the posterior knee down to the medial ankle, covering the entire area several times uniformly.
2	660+800+905+970	9	6	3	Hz	500	27	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	9	6	3	Hz	1000	27	
4	660+800+905+970	9	6	3	Hz	2000	27	
5	660+800+905+970	9	6	3	Hz	5000	27	
6	660+800+905+970	9	6	3	Hz	10000	27	
7	660+800+905+970	9	6	3	Hz	15000	27	
8	660+800+905+970	9	6	3	Hz	20000	27	
9	660+800+905+970	9	6	3	Hz	10000	27	
10	660+800+905+970	9	6	3	Hz	5000	27	
11	660+800+905+970	9	6	3	Hz	1000	27	
450 seconds 7:30 minutes			Totals			Wound Dose (J) 270	Total Dose (J) 3150	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Diabetic Foot Ulcer 41-60 cm² / 6.1- 9 in²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	360	8	8	CW	CW	2880	** Treat the from the posterior knee down to the medial ankle, covering the entire area several times uniformly.
2	660+800+905+970	14	6	3	Hz	500	42	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	14	6	3	Hz	1000	42	
4	660+800+905+970	14	6	3	Hz	2000	42	
5	660+800+905+970	14	6	3	Hz	5000	42	
6	660+800+905+970	14	6	3	Hz	10000	42	
7	660+800+905+970	14	6	3	Hz	15000	42	
8	660+800+905+970	14	6	3	Hz	20000	42	
9	660+800+905+970	14	6	3	Hz	10000	42	
10	660+800+905+970	14	6	3	Hz	5000	42	
11	660+800+905+970	14	6	3	Hz	1000	42	
			500 seconds 8:20 minutes		Totals		Wound Dose (J) 420	Total Dose (J) 3300

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Diabetic Foot Ulcer 61-80 cm2 / 9.1- 12 in2								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	360	8	8	CW	CW	2880	** Treat the from the posterior knee down to the medial ankle, covering the entire area several times uniformly.
2	660+800+905+970	18	6	3	Hz	500	54	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	18	6	3	Hz	1000	54	
4	660+800+905+970	18	6	3	Hz	2000	54	
5	660+800+905+970	18	6	3	Hz	5000	54	
6	660+800+905+970	18	6	3	Hz	10000	54	
7	660+800+905+970	18	6	3	Hz	15000	54	
8	660+800+905+970	18	6	3	Hz	20000	54	
9	660+800+905+970	18	6	3	Hz	10000	54	
10	660+800+905+970	18	6	3	Hz	5000	54	
11	660+800+905+970	18	6	3	Hz	1000	54	
		540 seconds 9:00 minutes		Totals		Wound Dose (J) 540	Total Dose (J) 3420	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Diabetic Foot Ulcer 81-100 cm² / 12.1- 15 in²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	360	8	8	CW	CW	2880	** Treat the from the posterior knee down to the medial ankle, covering the entire area several times uniformly.
2	660+800+905+970	22	6	3	Hz	500	66	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	22	6	3	Hz	1000	66	
4	660+800+905+970	22	6	3	Hz	2000	66	
5	660+800+905+970	22	6	3	Hz	5000	66	
6	660+800+905+970	22	6	3	Hz	10000	66	
7	660+800+905+970	22	6	3	Hz	15000	66	
8	660+800+905+970	22	6	3	Hz	20000	66	
9	660+800+905+970	22	6	3	Hz	10000	66	
10	660+800+905+970	22	6	3	Hz	5000	66	
11	660+800+905+970	22	6	3	Hz	1000	66	
580 seconds 9:40 minutes			Totals			Wound Dose (J) 660	Total Dose (J) 3540	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Diabetic Foot Ulcer 101-120 cm² / 15.1- 18 in²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	360	8	8	CW	CW	2880	** Treat the from the posterior knee down to the medial ankle, covering the entire area several times uniformly.
2	660+800+905+970	25	6	3	Hz	500	75	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	25	6	3	Hz	1000	75	
4	660+800+905+970	25	6	3	Hz	2000	75	
5	660+800+905+970	25	6	3	Hz	5000	75	
6	660+800+905+970	25	6	3	Hz	10000	75	
7	660+800+905+970	25	6	3	Hz	15000	75	
8	660+800+905+970	25	6	3	Hz	20000	75	
9	660+800+905+970	25	6	3	Hz	10000	75	
10	660+800+905+970	25	6	3	Hz	5000	75	
11	660+800+905+970	25	6	3	Hz	1000	75	
610 seconds 10:10 minutes			Totals			Wound Dose (J) 750	Total Dose (J) 3630	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Diabetic Foot Ulcer 121-140 cm² / 18.1- 21 in²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	360	8	8	CW	CW	2880	** Treat the from the posterior knee down to the medial ankle, covering the entire area several times uniformly.
2	660+800+905+970	30	6	3	Hz	500	90	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	30	6	3	Hz	1000	90	
4	660+800+905+970	30	6	3	Hz	2000	90	
5	660+800+905+970	30	6	3	Hz	5000	90	
6	660+800+905+970	30	6	3	Hz	10000	90	
7	660+800+905+970	30	6	3	Hz	15000	90	
8	660+800+905+970	30	6	3	Hz	20000	90	
9	660+800+905+970	30	6	3	Hz	10000	90	
10	660+800+905+970	30	6	3	Hz	5000	90	
11	660+800+905+970	30	6	3	Hz	1000	90	
660 seconds 11:00 minutes			Totals			Wound Dose (J) 900	Total Dose (J) 3780	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Lower Limb Ulcer 5-20 cm² / 1-3 in²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	360	8	8	CW	CW	2880	** Treat the from the posterior knee down to the medial ankle, covering the entire area several times uniformly.
2	660+800+905+970	5	6	3	Hz	500	15	
3	660+800+905+970	5	6	3	Hz	1000	15	
4	660+800+905+970	5	6	3	Hz	2000	15	
5	660+800+905+970	5	6	3	Hz	5000	15	
6	660+800+905+970	5	6	3	Hz	10000	15	Uniform coverage of the wound PLUS 2.5cm/ 1 inch margin
7	660+800+905+970	5	6	3	Hz	15000	15	
8	660+800+905+970	5	6	3	Hz	20000	15	
9	660+800+905+970	5	6	3	Hz	10000	15	
10	660+800+905+970	5	6	3	Hz	5000	15	
11	660+800+905+970	5	6	3	Hz	1000	15	
		410 seconds 6:50 minutes		Totals		Wound Dose (J) 150	Total Dose (J) 3030	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Lower Limb Ulcer 21-40 cm ² / 3.1- 6 in ²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	480	10	10	CW	CW	4800	** Treat the femoral artery following from the groin down the medial thigh to the posterior knee, covering the entire area several times uniformly
2	660+800+905+970	9	6	3	Hz	500	27	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	9	6	3	Hz	1000	27	
4	660+800+905+970	9	6	3	Hz	2000	27	
5	660+800+905+970	9	6	3	Hz	5000	27	
6	660+800+905+970	9	6	3	Hz	10000	27	
7	660+800+905+970	9	6	3	Hz	15000	27	
8	660+800+905+970	9	6	3	Hz	20000	27	
9	660+800+905+970	9	6	3	Hz	10000	27	
10	660+800+905+970	9	6	3	Hz	5000	27	
11	660+800+905+970	9	6	3	Hz	1000	27	
			570 seconds 9:30 minutes	Totals		Wound Dose (J) 270	Total Dose (J) 5070	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Lower Limb Ulcer 41-60 cm ² / 6.1- 9 in ²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	480	10	10	CW	CW	4800	** Treat the femoral artery following from the groin down the medial thigh to the posterior knee, covering the entire area several times uniformly
2	660+800+905+970	14	6	3	Hz	500	42	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	14	6	3	Hz	1000	42	
4	660+800+905+970	14	6	3	Hz	2000	42	
5	660+800+905+970	14	6	3	Hz	5000	42	
6	660+800+905+970	14	6	3	Hz	10000	42	
7	660+800+905+970	14	6	3	Hz	15000	42	
8	660+800+905+970	14	6	3	Hz	20000	42	
9	660+800+905+970	14	6	3	Hz	10000	42	
10	660+800+905+970	14	6	3	Hz	5000	42	
11	660+800+905+970	14	6	3	Hz	1000	42	
		620 seconds 10:20 minutes	Totals			Wound Dose (J) 420	Total Dose (J) 5220	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Lower Limb Ulcer 61-80 cm ² / 9.1- 12 in ²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	480	10	10	CW	CW	4800	** Treat the femoral artery following from the groin down the medial thigh to the posterior knee, covering the entire area several times uniformly
2	660+800+905+970	18	6	3	Hz	500	54	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	18	6	3	Hz	1000	54	
4	660+800+905+970	18	6	3	Hz	2000	54	
5	660+800+905+970	18	6	3	Hz	5000	54	
6	660+800+905+970	18	6	3	Hz	10000	54	
7	660+800+905+970	18	6	3	Hz	15000	54	
8	660+800+905+970	18	6	3	Hz	20000	54	
9	660+800+905+970	18	6	3	Hz	10000	54	
10	660+800+905+970	18	6	3	Hz	5000	54	
11	660+800+905+970	18	6	3	Hz	1000	54	
660 seconds 11:00 minutes			Totals			Wound Dose (J) 540	Total Dose (J) 5340	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Lower Limb Ulcer 81-100 cm ² / 12.1- 15 in ²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	480	10	10	CW	CW	4800	** Treat the femoral artery following from the groin down the medial thigh to the posterior knee, covering the entire area several times uniformly
2	660+800+905+970	22	6	3	Hz	500	66	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	22	6	3	Hz	1000	66	
4	660+800+905+970	22	6	3	Hz	2000	66	
5	660+800+905+970	22	6	3	Hz	5000	66	
6	660+800+905+970	22	6	3	Hz	10000	66	
7	660+800+905+970	22	6	3	Hz	15000	66	
8	660+800+905+970	22	6	3	Hz	20000	66	
9	660+800+905+970	22	6	3	Hz	10000	66	
10	660+800+905+970	22	6	3	Hz	5000	66	
11	660+800+905+970	22	6	3	Hz	1000	66	
			700 seconds 11:40 minutes	Totals		Wound Dose (J) 660	Total Dose (J) 5460	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Lower Limb Ulcer 101-120 cm² / 15.1- 18 in²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	480	10	10	CW	CW	4800	** Treat the femoral artery following from the groin down the medial thigh to the posterior knee, covering the entire area several times uniformly
2	660+800+905+970	25	6	3	Hz	500	75	Uniform coverage of the wound PLUS 2.5cm / 1inch margin
3	660+800+905+970	25	6	3	Hz	1000	75	
4	660+800+905+970	25	6	3	Hz	2000	75	
5	660+800+905+970	25	6	3	Hz	5000	75	
6	660+800+905+970	25	6	3	Hz	10000	75	
7	660+800+905+970	25	6	3	Hz	15000	75	
8	660+800+905+970	25	6	3	Hz	20000	75	
9	660+800+905+970	25	6	3	Hz	10000	75	
10	660+800+905+970	25	6	3	Hz	5000	75	
11	660+800+905+970	25	6	3	Hz	1000	75	
		730 seconds 12:10 minutes	Totals			Wound Dose (J) 750	Total Dose (J) 5550	

** Patient should occasionally attempt to flex/extend foot while in CW mode.

Lower Limb Ulcer 121-140 cm² / 18.1-21 in²								
Phase Number	Wavelengths (nm)	Phase Time (s)	Peak Power (W)	Average Power (W)	Output Mode (CW, Hz, or ISP)	Frequency (Hz)	Energy (J)	Treatment Area
1	660+800+905+970	360	8	8	CW	CW	2880	** Treat the from the posterior knee down to the medial ankle, covering the entire area several times uniformly.
2	660+800+905+970	30	6	3	Hz	500	90	Uniform coverage of the wound PLUS 2.5cm/ 1 inch margin
3	660+800+905+970	30	6	3	Hz	1000	90	
4	660+800+905+970	30	6	3	Hz	2000	90	
5	660+800+905+970	30	6	3	Hz	5000	90	
6	660+800+905+970	30	6	3	Hz	10000	90	
7	660+800+905+970	30	6	3	Hz	15000	90	
8	660+800+905+970	30	6	3	Hz	20000	90	
9	660+800+905+970	30	6	3	Hz	10000	90	
10	660+800+905+970	30	6	3	Hz	5000	90	
11	660+800+905+970	30	6	3	Hz	1000	90	
		660 seconds 11:00 minutes	Totals			Wound Dose (J) 900	Total Dose (J) 3780	