

**WALT Veterinary Dosage Recommendations Task Force**  
**Stationary Contact Application: CW & Switched/Gated CW**

**FELINE 10 lb: Osteoarthritis/Degenerative Joint Disease**

<b>PATHOLOGY / ANATOMICAL LOCATION</b>	<b>PROBE TYPE</b> <i>Note 1.</i>	<b>NUMBER OF PROBE APPLICATIONS</b> Points / Sites <i>Note 2.</i>	<b>DURATION PER POINT / SITE</b> (seconds)	<b>TOTAL TREATMENT DURATION</b> (min:sec)	<b>TOTAL AVERAGE POWER</b> (Watts) <i>Note 3.</i>	<b>TOTAL EMITTED ENERGY</b> (Joules) <i>Note 7.</i>	<b>SURFACE IRRADIANCE</b> (W/cm <sup>2</sup> ) <i>Note 4.</i>	<b>FLUENCE AT TARGET POINT/SITE</b> (Joules/cm <sup>2</sup> )
Manus/Pes	Single	2	20 – 30	0:40 – 1:00	0.05 – 0.25	3.0 – 10.0	0.05 – 0.25	1.5 – 5.0
	Multi	1 – 2	20 – 30	0:30 – 0:40	0.25 – 1.25	10.0 – 37.5	0.05 – 0.25	1.5 – 5.0
	Cluster	1 – 2	40 – 90	1:20 – 1:30	0.10 – 0.75	9.0 – 60.0	0.03 – 0.10	2.7 – 4.0
Carpus/Tarsus	Single	2 – 4	20 – 30	1:00 – 1:20	0.05 – 0.25	3.0 – 20.0	0.05 – 0.25	1.5 – 5.0
	Multi	1 – 2	20 – 30	0:30 – 0:40	0.25 – 1.25	10.0 – 37.5	0.05 – 0.25	1.5 – 5.0
	Cluster	1 – 2	40 – 90	1:20 – 1:30	0.10 – 0.75	9.0 – 60.0	0.03 – 0.10	2.7 – 4.0
Elbow	Single	2 – 4	20 – 30	1:00 – 1:20	0.10 – 0.25	6.0 – 20.0	0.10 – 0.25	3.0 – 5.0
	Multi	1 – 2	20 – 30	0:30 – 0:40	0.25 – 1.25	20.0 – 37.5	0.10 – 0.25	3.0 – 5.0
	Cluster	2 – 3	40 – 90	2:20 – 3:00	0.10 – 0.75	18.0 – 90.0	0.03 – 0.10	2.7 – 4.0
Shoulder	Single	3 – 6	20 – 30	1:30 – 2:00	0.10 – 0.25	12.0 – 22.5	0.10 – 0.25	3.0 – 5.0
	Multi	1 – 2	20 – 30	0:30 – 0:40	0.25 – 1.25	20.0 – 37.5	0.10 – 0.25	3.0 – 5.0
	Cluster	2 – 4	40 – 90	2:40 – 3:00	0.10 – 0.75	24.0 – 135.0	0.03 – 0.10	2.7 – 4.0
Stifle	Single	4 – 8	20 – 30	2:00 – 2:40	0.10 – 0.25	16.0 – 30.0	0.10 – 0.25	3.0 – 5.0
	Multi	1 – 2	20 – 30	0:30 – 0:40	0.50 – 1.25	20.0 – 37.5	0.10 – 0.25	3.0 – 5.0
	Cluster	2 – 4	40 – 90	2:40 – 3:00	0.10 – 0.75	18.0 – 120.0	0.03 – 0.10	2.7 – 4.0
Hip	Single	4 – 8	20 – 30	2:00 – 2:40	0.20 – 0.50	16.0 – 30.0	0.20 – 0.50	6.0 – 10.0
	Multi	1 – 2	20 – 30	0:30 – 0:40	1.00 – 1.25	20.0 – 37.5	0.20 – 0.50	6.0 – 10.0
	Cluster	2 – 4	40 – 90	2:40 – 3:00	0.20 – 0.75	36.0 – 120.0	0.03 – 0.25	2.7 – 10.0
Back - Lumbar	Single	8 – 12	20 – 30	3:30 – 4:30	0.20 – 0.50	48.0 – 120.0	0.20 – 0.50	6.0 – 10.0
	Multi	2 – 3	20 – 30	1:00 – 1:30	1.00 – 2.50	60.0 – 150.0	0.20 – 0.50	6.0 – 10.0
	Cluster	4 – 6	40 – 90	3:20 – 6:00	0.10 – 0.75	36.0 – 150.0	0.03 – 0.10	2.7 – 4.0
Back - Thoracic	Single	8 – 12	20 – 30	3:30 – 4:30	0.20 – 0.50	48.0 – 120.0	0.20 – 0.50	6.0 – 10.0
	Multi	2 – 3	20 – 30	1:00 – 1:30	1.00 – 2.50	60.0 – 150.0	0.20 – 0.50	6.0 – 10.0
	Cluster	4 – 6	40 – 90	3:20 – 6:00	0.10 – 0.75	36.0 – 180.0	0.03 – 0.10	2.7 – 4.0
Neck	Single	6 – 10	20 – 30	3:00 – 3:20	0.20 – 0.25	36.0 – 50.0	0.20 – 0.50	6.0 – 10.0
	Multi	2 – 3	20 – 30	1:00 – 1:30	1.00 – 1.25	60.0 – 75.0	0.20 – 0.50	6.0 – 10.0
	Cluster	4 – 6	60 – 90	6:00 – 6:20	0.10 – 0.75	36.0 – 270.0	0.03 – 0.10	2.7 – 6.0

**FELINE 10 lb: IVDD; Wounds**

IVDD	Single	16 – 32	20 – 30	8:00 – 10:40	0.20 – 0.25	120.0 – 128.0	0.20 – 0.50	6.0 – 10.0
	Multi	3 – 6	20 – 30	1:30 – 2:30	1.00 – 1.25	150.0 – 160.0	0.20 – 0.50	6.0 – 10.0
	Cluster	4 – 8	60 – 90	6:00 – 8:00	0.10 – 0.75	48.0 – 270.0	0.03 – 0.10	2.7 – 6.0
Superficial/Acute Wound <i>Note 5.</i>	Single	Treat intact skin around entire wound periphery.	20 – 40	As applicable.	0.04 – 0.20	As applicable.	0.04 – 0.20	1.6 – 4.0
	Multi		20 – 40		0.20 – 1.00		0.04 – 0.20	1.6 – 4.0
	Cluster		30 – 60		0.10 – 0.75		0.03 – 0.10	1.8 – 3.0
Difficult Wound <i>Note 5 &amp; 6.</i>	Single	Treat intact skin around entire wound periphery.	20 – 40	As applicable.	0.04 – 0.20	As applicable.	0.04 – 0.20	1.6 – 4.0
	Multi		20 – 40		0.20 – 1.00		0.04 – 0.20	1.6 – 4.0
	Cluster		30 – 60		0.10 – 0.75		0.03 – 0.10	1.8 – 3.0

**WALT Veterinary Dosage Recommendations Task Force**  
**Stationary Contact Application: CW & Switched/Gated CW**

**CANINE 50 lb: Osteoarthritis/Degenerative Joint Disease**

<b>PATHOLOGY / ANATOMICAL LOCATION</b>	<b>PROBE TYPE</b> <i>Note 1.</i>	<b>NUMBER OF PROBE APPLICATIONS</b> Points / Sites <i>Note 2.</i>	<b>DURATION PER POINT / SITE</b> (seconds)	<b>TOTAL TREATMENT DURATION</b> (min:sec)	<b>TOTAL AVERAGE POWER</b> (Watts) <i>Note 3.</i>	<b>TOTAL EMITTED ENERGY</b> (Joules) <i>Note 7.</i>	<b>SURFACE IRRADIANCE</b> (W/cm <sup>2</sup> ) <i>Note 4.</i>	<b>FLUENCE AT TARGET POINT/SITE</b> (Joules/cm <sup>2</sup> )
Manus/Pes	Single	3 – 5	20 – 30	1:30 – 1:40	0.05 – 0.25	5.0 – 22.5	0.05 – 0.25	1.5 – 5.0
	Multi	1 – 2	20 – 30	0:30 – 0:40	0.25 – 1.25	10.0 – 37.5	0.05 – 0.25	1.5 – 5.0
	Cluster	1 – 2	40 – 90	1:20 – 1:30	0.10 – 0.75	9.0 – 60.0	0.05 – 0.10	4.0 – 4.5
Carpus/Tarsus	Single	3 – 5	20 – 30	1:30 – 1:40	0.05 – 0.25	5.0 – 22.5	0.05 – 0.25	1.5 – 5.0
	Multi	1 – 2	20 – 30	0:30 – 0:40	0.25 – 1.25	10.0 – 37.5	0.05 – 0.25	1.5 – 5.0
	Cluster	1 – 2	40 – 90	1:20 – 1:30	0.10 – 0.75	9.0 – 60.0	0.05 – 0.10	4.0 – 4.5
Elbow	Single	8 – 12	20 – 30	4:00 – 4:20	0.05 – 0.25	24.0 – 60.0	0.10 – 0.25	3.0 – 5.0
	Multi	2 – 3	20 – 30	1:00 – 1:20	0.25 – 1.25	30.0 – 75.0	0.10 – 0.25	3.0 – 5.0
	Cluster	3 – 4	40 – 90	2:40 – 4:30	0.10 – 0.75	27.0 – 120.0	0.05 – 0.10	4.0 – 4.5
Shoulder	Single	8 – 12	20 – 30	4:00 – 4:20	0.05 – 0.25	24.0 – 60.0	0.10 – 0.25	3.0 – 5.0
	Multi	2 – 3	20 – 30	1:00 – 1:20	0.25 – 1.25	30.0 – 75.0	0.10 – 0.25	3.0 – 5.0
	Cluster	3 – 4	40 – 90	2:40 – 4:30	0.10 – 0.75	27.0 – 120.0	0.05 – 0.10	4.0 – 4.5
Stifle	Single	12 – 16	20 – 30	5:20 – 6:00	0.05 – 0.25	36.0 – 80.0	0.10 – 0.25	3.0 – 5.0
	Multi	3 – 4	20 – 30	1:20 – 1:30	0.25 – 1.25	45.0 – 100.0	0.10 – 0.25	3.0 – 5.0
	Cluster	3 – 4	40 – 90	2:40 – 4:30	0.10 – 0.75	27.0 – 120.0	0.05 – 0.10	4.0 – 4.5
Hip	Single	12 – 16	20 – 30	5:20 – 6:00	0.05 – 0.25	36.0 – 80.0	0.20 – 0.50	6.0 – 10.0
	Multi	3 – 4	20 – 30	1:20 – 1:30	0.25 – 1.25	45.0 – 100.0	0.20 – 0.50	6.0 – 10.0
	Cluster	3 – 4	40 – 90	2:40 – 4:30	0.20 – 0.75	54.0 – 120.0	0.10 – 0.25	9.0 – 10.0
Back - Lumbar	Single	28 – 32	20 – 30	10:40 – 14:00	0.20 – 0.50	168.0 – 320.0	0.20 – 0.50	6.0 – 10.0
	Multi	8 – 9	20 – 30	3:00 – 4:00	1.00 – 2.50	240.0 – 450.0	0.20 – 0.50	6.0 – 10.0
	Cluster	8 – 9	40 – 90	6:00 – 12:00	0.10 – 0.75	72.0 – 270.0	0.05 – 0.10	4.0 – 4.5
Back - Thoracic	Single	36 – 40	20 – 30	13:20 – 18:00	0.20 – 0.50	216.0 – 400.0	0.20 – 0.50	6.0 – 10.0
	Multi	9 – 10	20 – 30	3:20 – 4:30	1.00 – 2.50	270.0 – 500.0	0.20 – 0.50	6.0 – 10.0
	Cluster	9 – 10	40 – 90	6:40 – 13:20	0.10 – 0.75	200.0 – 243.0	0.05 – 0.10	4.0 – 4.5
Neck	Single	18 – 24	20 – 30	8:00 – 9:00	0.20 – 0.25	108.0 – 120.0	0.20 – 0.50	6.0 – 10.0
	Multi	5 – 6	20 – 30	2:00 – 2:30	1.00 – 1.25	150.0 – 150.0	0.20 – 0.50	6.0 – 10.0
	Cluster	5 – 6	60 – 90	6:00 – 7:30	0.10 – 0.75	135.0 – 180.0	0.05 – 0.10	4.5 – 6.0

**CANINE 50 lb: IVDD; Wounds**

IVDD	Single	32 – 64	20 – 30	16:00 – 21:20	0.20 – 0.25	240.0 – 256.0	0.20 – 0.50	6.0 – 10.0
	Multi	8 – 16	20 – 30	4:00 – 5:20	1.00 – 1.25	300.0 – 320.0	0.20 – 0.50	6.0 – 10.0
	Cluster	8 – 16	60 – 90	12:00 – 16:00	0.10 – 0.75	288.0 – 326.0	0.05 – 0.10	4.0 – 6.0
Superficial/Acute Wound <i>Note 5.</i>	Single	Treat over intact skin around entire wound periphery.	20 – 40	As applicable.	0.05 – 0.25	As applicable.	0.04 – 0.20	1.6 – 4.0
	Multi		20 – 40		0.25 – 1.25		0.04 – 0.20	1.6 – 4.0
	Cluster		30 – 60		0.10 – 0.75		0.03 – 0.10	1.8 – 3.0
Difficult Wound <i>Note 5 &amp; 6.</i>	Single	Treat over intact skin around entire wound periphery.	20 – 40	As applicable.	0.05 – 0.25	As applicable.	0.04 – 0.20	1.6 – 4.0
	Multi		20 – 40		0.25 – 1.25		0.04 – 0.20	1.6 – 4.0
	Cluster		30 – 60		0.10 – 0.75		0.03 – 0.10	1.8 – 3.0

## WALT Veterinary Dosage Recommendations Task Force

### Stationary Contact Application: CW & Switched/Gated CW

#### Notes:

1. For the purposes of this document, the applicator used to deliver light to the patient is called the 'probe', and probes are typically available in three general styles:
  - a. Single: The probe contains a single (typically laser) emitter and treats one point at a time.
  - b. Multi: The probe contains 4-5 (typically laser) emitters, each of which projects a distinct and separate beam spot upon the skin; from a treatment perspective, such probes can be considered as treating 4-5 distinct points concurrently, thus reducing total treatment time compared to a single-emitter probe.
  - c. Cluster: The probe contains an array of closely-spaced LEDs and/or lower-power laser diodes, with little or no space between beam spots upon the skin. Typically, clusters such as this project a large and almost-homogeneous beam spot upon the skin.
2. A 'point' is nominally defined as a contact region with the skin or tissue of less than or equal to  $1 \text{ cm}^2$ , or the beam spot size upon the skin, whichever is larger. A 'site' refers to a multiple of points within the region of single contact application of a Multi probe, or the overall area contacted by a Cluster probe at one time. Individual application points or sites may be immediately adjacent or spaced some appropriate distance apart; typically, they do not overlap.
3. In this document, 'power' refers to the average power of the incident beam, whether from a continuous wave (CW) or switched (a.k.a. gated or chopped) CW source.
4. Irradiance is the intensity of the beam of light upon the irradiated surface.
5. When treating wounds, treat the entire wound periphery but avoid overlapping of placements. If direct treatment of the wound is desired, such as accelerating the development of a granulation bed, the probe should be held directly over but slightly away from the wound surface or covered with disposable clear plastic (i.e. sterile sleeve) to avoid contamination.
6. PBM as an adjunct therapy to sound medical and surgical management of difficult wounds may involve increasing frequency of treatments and ensuring the fluence falls within the biostimulatory range of  $1-4 \text{ J/cm}^2$ .
7. The 'total emitted energy' refers to the total amount of energy emitted from the probe during the 'total treatment duration', given the probe's 'total average power'. The total incident energy – i.e., the energy actually received at the skin – may be proportionally less than the total emitted energy, depending upon the size of the anatomical target in relation to the size of a multi-emitter probe.

**User should be familiar with device specifications. Consult device documentation or manufacturer regarding any information that is unclear or absent.**

#### Additional Considerations:

- Above protocols are for an 'ideal' 10-pound feline and 50-pound canine with light coat. Treatment times may need to be adjusted up or down depending on estimated target depth, size and pigmentation of patient.
- Applicable power for each laser emitter in single-emitter and multi-emitter probes is 50-1000 mW in the wavelength range 780-860 nm.
- Applicable total power for infrared LED &/or laser clusters is 200-1400 mW in the wavelength range 780-860 nm. The recommended minimum average irradiance of such cluster probes is  $25 \text{ mW/cm}^2$ , with  $40-50 \text{ mW/cm}^2$  being preferred.
- Wavelengths from 630-690 nm are typically used for superficial tendons, skin conditions and wounds. They may be used for general musculoskeletal disorders, however, the lesser penetration of these wavelengths may make them unsuitable for targets deeper than 1-2 cm.
- Recommended technique is stationary skin contact with appropriate amount of pressure applied for target depth and moderated according to patient's tolerance.
- Acute conditions may respond better initially to increased frequency of treatment and/or increased treatment time.

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- Effort should be made to maximize light delivered to target tissue without interference. This may be achieved by increasing probe pressure on skin surface, using comb-like protruding lens or diode devices, manipulating fur away from target, clipping, cleaning skin and hair with alcohol, and/or wetting the hair coat.
- Laser PBM has both local and distal/systemic effects, all of which contribute toward the desired clinical outcome. Ideally, local irradiation directly over the injured/pathologic tissue is performed, and additional sites, such as trigger points and dorsal roots, can be incorporated to maximize pain management. To maximize systemic effects, incorporate irradiation over proximal/regional lymph nodes and major arteries or veins into any treatment protocol. Irradiation over bone containing active marrow has been shown to increase the number of circulating stem cells which may be recruited by diseased tissue to replace and regenerate injured cells, stimulate angiogenesis and decrease inflammatory and fibrotic factors.
- Switched-CW may be of benefit in treatment with PBM, but at this juncture not enough is known to make set recommendations about when to use Switched-CW versus CW, and/or which specific frequencies to use.
- Super-Pulsed lasers are addressed separately, due to their significantly different mode of operation.