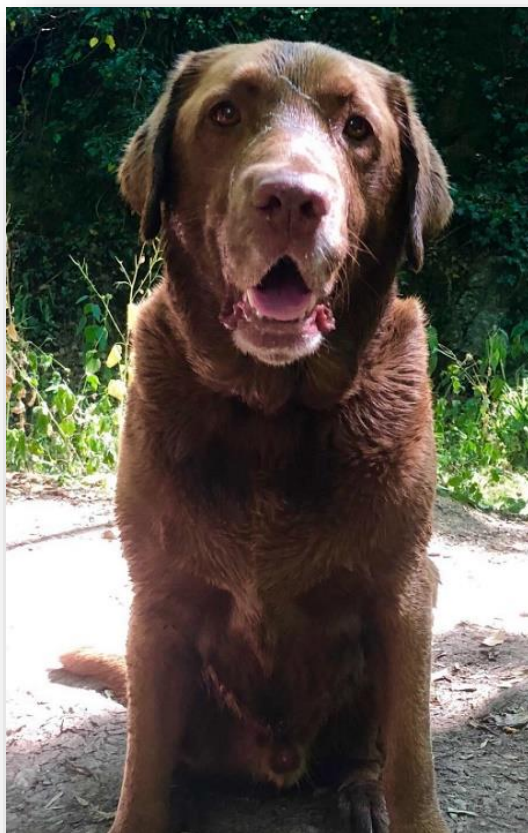


The Effect of Phototherapy & Massage on the Heart Rate & Passive Range of Motion of Canines with Elbow Osteoarthritis



Harriet Kitcat
[PhysioMyDog](#)
Autumn 2019



I carried out a research project for a deeper understanding of how therapeutic equipment & massage can influence conservative management of osteoarthritis in the elbow in dogs, both physically & psychologically.

Many of the dogs I treat have osteoarthritis, which is no surprise when you look at the statistics. Osteoarthritis is the most common musculoskeletal disorder recorded by vets (Rvc.ac.uk, 2019) and data shows 1 in 5 dogs are affected with OA (CAM 2019) and the Golden Retriever and Labrador breeds are most prevalent. (Anderson KL, O'Neill DG, Brodbelt DC, et al)

“Osteoarthritis is a joint disease characterized by a progressive cascade of mechanical and biochemical events leading to cartilage destruction, subchondral bone sclerosis, synovial membrane inflammation and the formation of periarticular osteophytes.” (Bockstahler et al 2019)

“Osteoarthritis is the most common cause of chronic pain in dogs. It affects 4 out of 5 older dogs. It is a disabling, non-curable, and progressive disease which initially focuses on moving joints but eventually affects the whole dog and is a major cause of euthanasia due to loss of quality of life.” Canine Arthritis Management

Objective of Study

Investigate what impact therapeutic massage and equipment has on how a dog with elbow osteoarthritis moves, by measuring their elbow passive range of motion (PROM) and their wellbeing by measuring their heart rate.

Study

A small controlled study was carried out to investigate the impact of Phototherapy and Massage on dogs with Elbow OA.

Criteria of Dogs

- Labrador or Golden Retriever Breeds
- Weighing between 20-40kg
- Aged 2+ years
- Owners agree to vet consent
- Diagnosed elbow OA by vet
- Managing conservatively
- Not on drugs or been on for 2 months+
- Sessions completed in same environment
- Not walked within hour before sessions
- During research time period
 - Don't have any other therapy
 - Don't start/stop medication, supplements or change diets.

Study Methodology

- Dogs were split into 2 groups (3 in each)
- Each dog had 3 sessions in total, spaced 7 days apart.
 - Group 1 – Phototherapy via [Photizo Vet Care Device](#) & Massage
 - Group 2 – Phototherapy Only via [Photizo Vet Care Device](#)
 - Session 1 - Measurements Only
 - Session 2 - Phototherapy & Massage or Phototherapy Only
 - Session 3 - Both groups had massage only
- Before and after each treatment session, heart rate and passive range of motion (elbow extension and flexion) measurements were taken.
- Owners completed daily questionnaire to grade how their dogs were moving and feeling.

Results

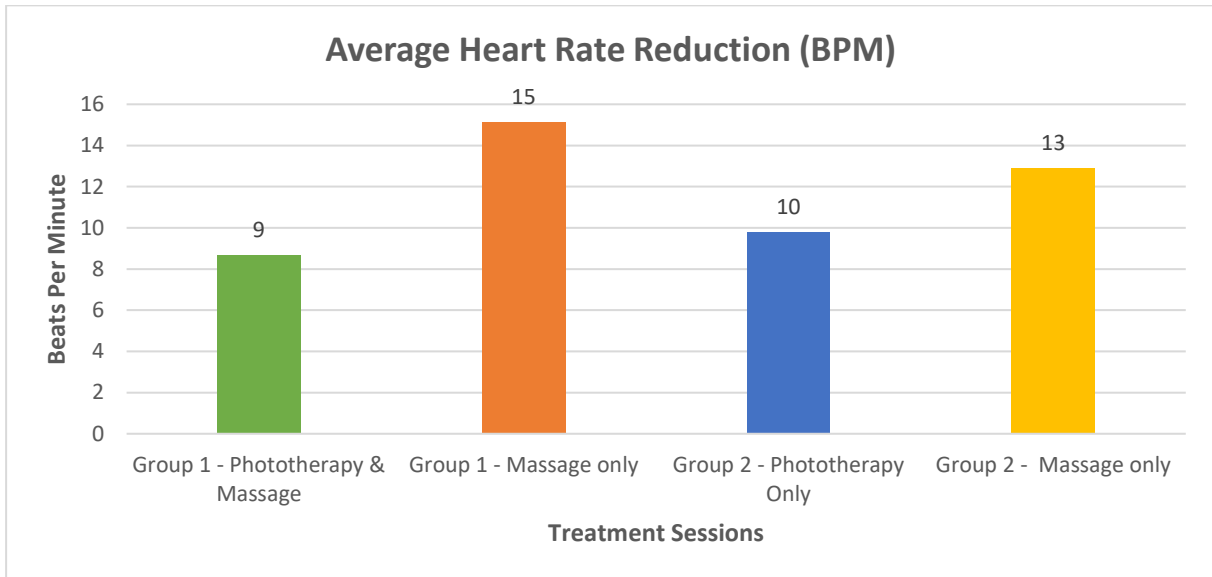
See Appendix for individual results per case study.

Massage Only showed bigger reduction in Heart Rate = improved wellbeing

Massage and Phototherapy Combined showed more improvements in Passive Range of Motion = improved movement.

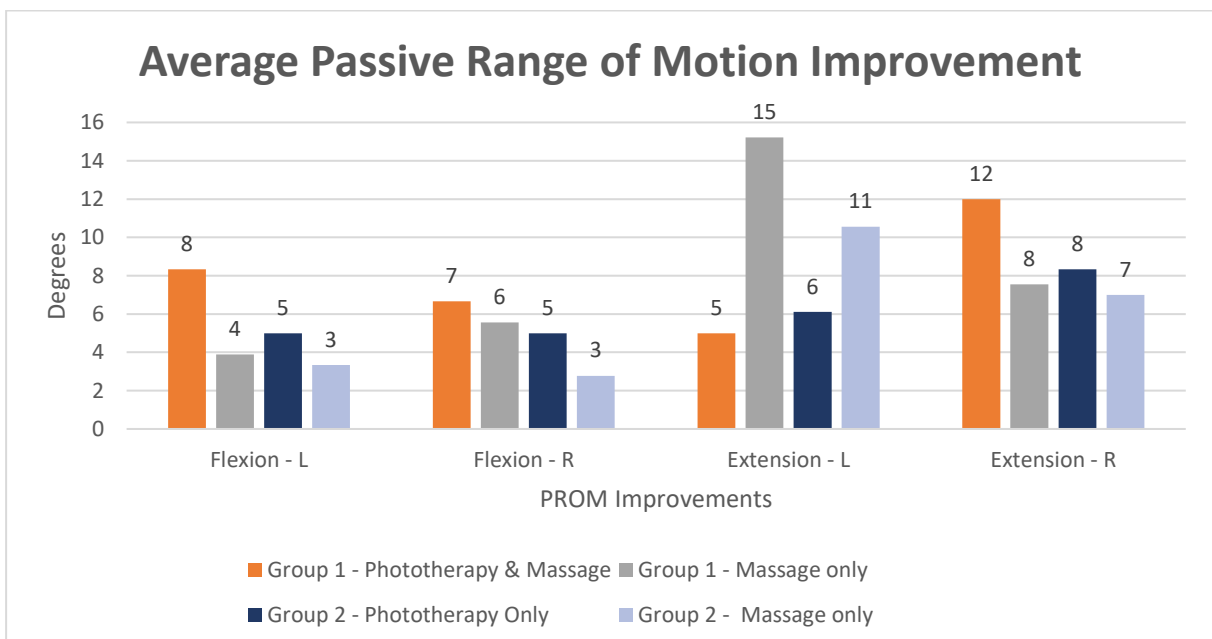
Heart Rate/Wellbeing

- Both groups saw a bigger reduction in heart rate from **Massage Only** sessions.
- Significant reduction from Phototherapy & Massage Combined and Phototherapy only sessions.



Passive Range of Motion/Movement

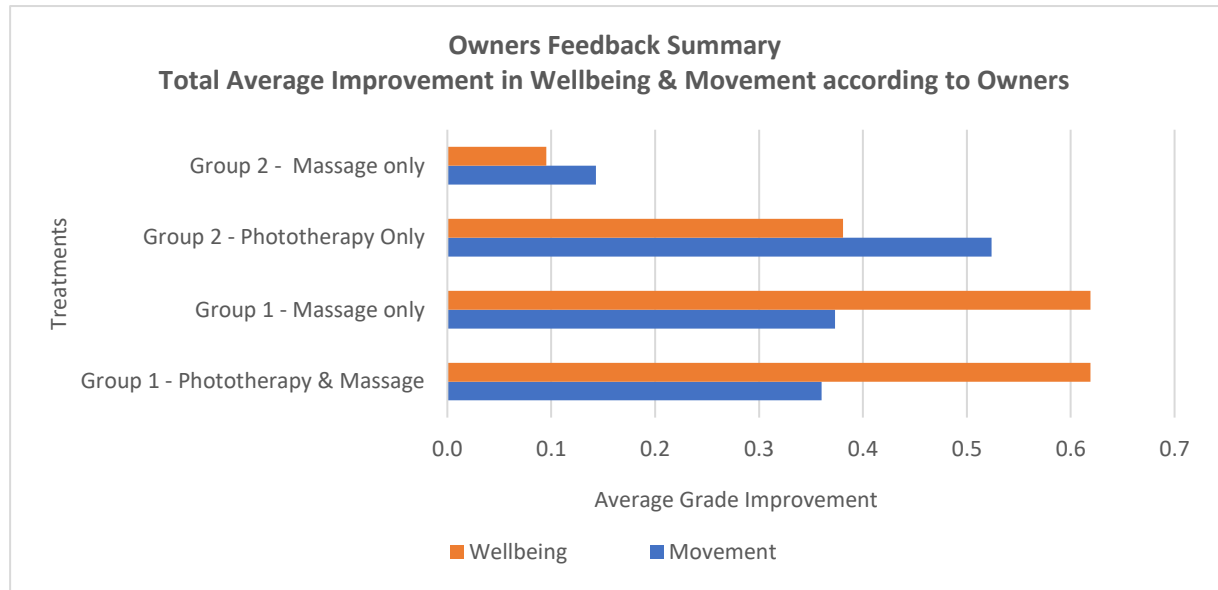
- More improved PROM measurements came from **Phototherapy and Massage combined** session (Group 1)
- Biggest single PROM improvement (Ext) came from Group 2's Massage Only session.
- Bigger improvement in extension compared to flexion.



Further Analysis & Comparison

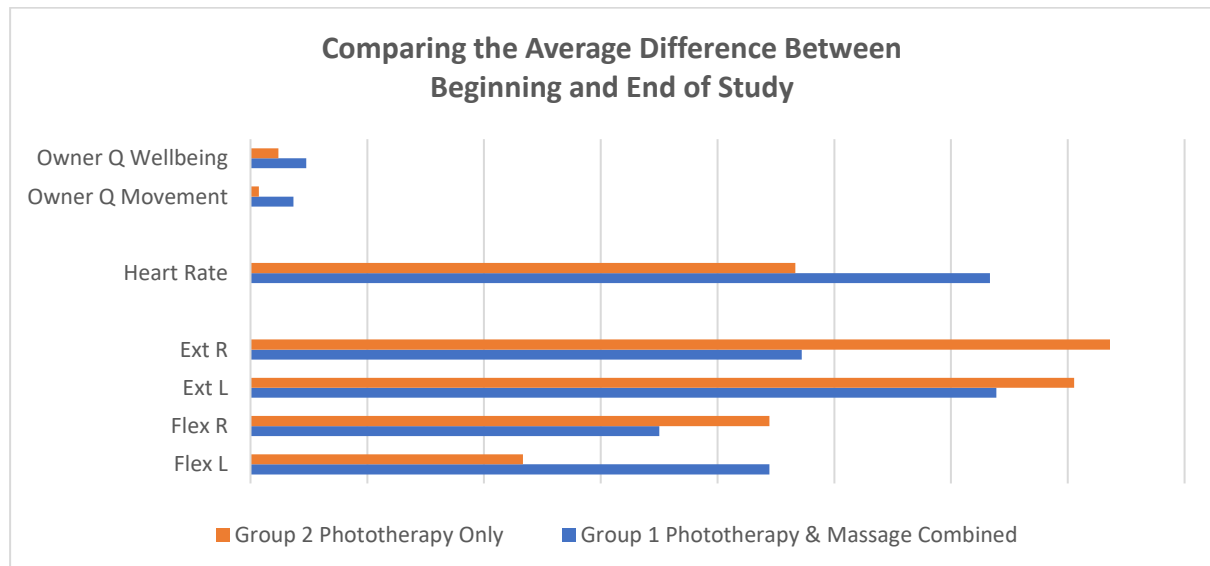
Owner Feedback

- **Heart Rate/Wellbeing** - After **Phototherapy and Massage Combined & Massage only** sessions (Group 1), owners saw the best results in wellbeing
- **Passive Range of Motion/Movement** - After **Phototherapy Only** session & **Massage only** session (Group 2), owners saw the best result in movement.



Start to End Results

- **Heart Rate/Wellbeing** - Group 1 (**Phototherapy & Massage**) – Heart rate decreased the most and owners reported bigger improvement in wellbeing (& movement)
- **Passive Range of Motion/Movement** - Group 2 (**Phototherapy Only**) saw better PROM results



Discussion of Results

All dogs should be treated as an individual. A modality/treatment plan etc that helps one dog, will be different to the next. Visually it was clear some dogs preferred phototherapy vs massage. Finding the right multimodal plan and monitoring their response is crucial as part of decision-making process.

Successful treatment of conditions such as Elbow Osteoarthritis and how best to manage (conservatively or operate) comes from an open dialogue and working relationships between owner and all professions (such as vet, therapists, dog walker) involved and will depend on a dog's

- Age
- Home environment
- Lifestyle
- Diet & Nutrition
- Weight
- Severity/progression of condition
- Owners expectations
- Overall health
- Exercise & weight management
- Budget
- Therapies available

"There is strong evidence that electro physical modalities used in conjunction with manual therapies, such as massage, improve and speed up recovery."

The way to achieve the best results with this modality is to apply regularly, eg. at least 3x per week or even daily." Ruth Milner, Director and Product Specialist, Photizo Distributor Dante Products

Appendix

Group 1 – Massage & Phototherapy Combined

Case Study 1

Description

- Yellow Labrador - Female
- BCS 7
- Lameness score 1
- Weighs 31 kg
- 7 Years old
- Never had any form of therapy.



Lifestyle

- Lives with owners (married couple), young child and 2 year old active dog.
- Rehomed a year ago, after original owners didn't have time/funds to care for her
- Never done agility or high intensity activity.
- Sleeps on suitable bedding, allowed on the sofa and upstairs.
- One 40 minute walk daily, gentle stroll mainly off lead on mixture of tarmac and grass.
- Remainder of day with one owner & child. Some interaction with other dog, tries to sleep on sofa or in small garden.

History

- Lameness investigated aged one year. Originally lame on front left, but changeable.
- Referred and diagnosed with bilateral elbow dysplasia aged 2.
- Front left worse OA affected limb.
- Previous owner opted for conservative management and soon after re-homed to current owner.
- Not on any medication or supplements
- Fed medium quality kibble.

My Assessment

- Hind right stride shorter than hind left
- Forelimb stride even but "paddle" gait
- Forelimb muscle atrophy bilaterally. Front left most affected.
- Good hind muscle mass and tone.
- Tension around elbows, shoulders, mid thoracic.

| Group 1 - Case Study 1 | Treatment | Outcome |
|--|---|--|
| Session 1 – Measurements Taken Only | Enjoyed having attention. Was uncomfortable when measurements taken. | |
| Session 2 – Massage & Phototherapy Combined | <ul style="list-style-type: none"> • Didn't enjoy measurements being taken • Relaxed in particular when Photizo was applied • Preferred Photizo application compared to massage techniques • Had stomach upset between sessions*. | <p>Movement</p> <ul style="list-style-type: none"> • L (improved flex by 3⁰ & Ext by 5⁰) • R (improved flex by 1⁰ & ext by 13⁰) <p>Wellbeing HR decreased by 15 BPM</p> <p>Owner Feedback</p> <ul style="list-style-type: none"> • Movement – n/a • Wellbeing – decreased* from 1.6 to 2.4 |
| Session 3 – Massage Only | Although did relax, more fidgety compared to previous session (hot day) | <p>Movement</p> <ul style="list-style-type: none"> • L (flex improved by 2⁰ & ext by improved 22⁰) |

| | | |
|-----------------------------|---|--|
| | | <ul style="list-style-type: none"> R (flex no change & ext by improved 4°) <p>Wellbeing</p> <ul style="list-style-type: none"> HR decreased by 9 BPM <p>Owner Feedback</p> <ul style="list-style-type: none"> Movement – N/a Wellbeing – improved from 2.4 to 2.0 |
| Overall | <ul style="list-style-type: none"> Biggest improvements in movement & wellbeing (except one) came from Phototherapy and Massage combined session Excellent improvement in ext from massage session. | |
| From Start to Finish | <p>Movement</p> <ul style="list-style-type: none"> L (improved Flex by 3° & Ext by 27°) R (improved Flex by 10° & Ext by 12°) <p>Wellbeing</p> <ul style="list-style-type: none"> HR decreased by 11 BPM <p>Owner Feedback</p> <ul style="list-style-type: none"> Movement – N/A Wellbeing – decreased from 1.6 to 2.0 <p>Owner acknowledged some overall improvement but nothing significant.</p> | |



Case Study 2

Description

- Black Labrador - Male
- BCS 4
- Lameness score 3
- Weighs 30kg
- 10 years old
- Rehomed at 5 years old was overweight and unfit.
- Never had any form of therapy.



Lifestyle

- Extremely well looked after and cared for. Owner focuses on mental stimulation, due to limited mobility tolerance.
- Never done agility or high intensity activity.
- Lives with owner, 2 teenagers and 5 year old dog.
- In full fitness walked up to 1.5 hours daily, now “potters” for 10-15 minutes once or twice daily.
- Rest of the time, snoozes in the front or back garden, gentle play with other dog, “chilling out”.
- Sleeps in appropriate bed, not in a draft. No access to slippery floors, stairs or sofa.

History

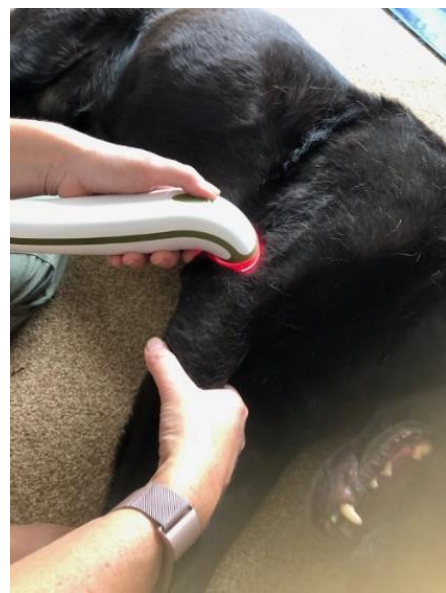
- OA in front right first diagnosed aged 5 years old
- Later OA diagnosed bilaterally on elbows and hips.
- Worse affected right elbow and left hip.
- Current medication Metacam, Paracetamol and YuMove & cold liver supplements.
- Fed high quality kibble diet.

My Assessment

- In stand, wide stance on all limbs.
- In walk, obvious front right and hind left lameness and stiffness.
- Muscle atrophy on all limbs. Most severe on front right and hind left.
- Goes from stand into sternum recumbency position very slowly and clearly uncomfortable.
- Tension around elbows, shoulders, thoracic, lumbar and all joints.

| Group 1 - Case Study 2 | Treatment | Outcome |
|--|---|--|
| Session 1 – Measurements Taken Only | When measurements were taken, seemed unsure, but improved when comforted by owner. | |
| Session 2 – Massage & Phototherapy Combined | <ul style="list-style-type: none"> • Uncomfortable when measurements taken, for comfort, mouthed favourite toy during session which he interpreted as “playtime*”, impacting HR level. • Didn’t enjoy Photizo beeps, although when applied, tolerated well. • Awkward and uncomfortable when moving him to treat other side. | <p>Movement</p> <ul style="list-style-type: none"> • L (improved flex by 17^o & ext by 3^o) • R (improved flex by 10^o & ext by 8^o) <p>Wellbeing HR increased* by 6 BPM</p> <p>Owner Feedback</p> <ul style="list-style-type: none"> • Movement – improved from 4.2 to 3.8 • Wellbeing – improved from 4.0 to 3.6 |
| Session 3 – Massage Only | <ul style="list-style-type: none"> • Naturally went into lateral recumbency position, as if he knew what to expect. • More comfortable when taking measurements, relaxed immediately into session, often falling asleep. | <p>Movement</p> <ul style="list-style-type: none"> • L (improved flex by 2^o & ext by 13^o) • R (improved flex by 12^o & ext by 8^o) <p>Wellbeing</p> <ul style="list-style-type: none"> • HR decreased by 23 BPM |

| | | |
|-----------------------------|---|---|
| | | Owner Feedback <ul style="list-style-type: none"> • Movement – improved from 3.8 to 3.3 • Wellbeing – improved from 3.6 to 2.3 |
| Overall | <ul style="list-style-type: none"> • Visibly appeared to prefer massage only, resulting in significant HR reduction. • Bigger PROM improvements from Phototherapy and Massage combined session | |
| From Start to Finish | Movement <ul style="list-style-type: none"> • L (improved flex by 18° & ext by 5°) • R (Flex no change, improved ext by 8°) Wellbeing <ul style="list-style-type: none"> • HR decreased by 4 BPM Owner Feedback <ul style="list-style-type: none"> • Movement – improved from 4.2 to 3.3 • Wellbeing – improved from 4.0 to 2.3 • Owner commented how she saw a pattern of improving after treatments, but as week went on, started to slowly decline | |



Case Study 3

Description

- Golden Retriever - Female
- BCS 8
- Lameness Score 1
- Weighs 35kg
- 9 Years old
- Rehomed 2 years ago with case study 4.
- Never had any form of therapy.



Lifestyle

- Lives with couple, both work from home and case study 4 dog.
- Exercised twice daily for 20 minutes, mainly grass. Rest of time has access to garden, usually snoozing on various beds.
- Does on occasion go upstairs, but usually sleeps downstairs on various bedding areas, some in drafts.
- Owners admit spoiling them and aware of weight gain.
- Rescued from puppy farm.

History

- Not much known about previous health history.
- OA diagnosed when owners first took her to Vet when rehomed.
- No medication. On YuMove.
- Fed medium quality kibble.

My Assessment

- Quite insecure, but very loving.
- Looks stiff in movement and awkward due to being overweight.
- In walk, slight head nod noting front right lameness.
- Tension around elbows, shoulders and hips bilaterally and thoracic

| Group 1 - Case Study 3 | Treatment | Outcome |
|---|--|--|
| Session 1 – Measurements Taken Only | Enjoyed the attention | |
| Session 2 – Massage & Phototherapy Combined | <ul style="list-style-type: none"> • Slightly unsure when measurements being taken • Didn't like Photizo beeps, but tolerated well when applied. | <p>Movement</p> <ul style="list-style-type: none"> • L (improved flex by 5° & ext by 7°) • R (improved flex by 8° & ext by 15°) <p>Wellbeing</p> <p>HR decreased by 17 BPM</p> <p>Owner Feedback</p> <ul style="list-style-type: none"> • Movement – improved from 2.7 to 2.0 • Wellbeing – improved from 2.0 to 1.4 |
| Session 3 – Massage Only | Settled immediately and fell asleep! | <p>Movement</p> <ul style="list-style-type: none"> • L (improved flex by 8° & ext by 10°) • R (improved flex by 5° & ext by 10°) <p>Wellbeing</p> <ul style="list-style-type: none"> • HR decreased by 13 BPM <p>Owner Feedback</p> <ul style="list-style-type: none"> • Movement – improved from 2.0 to 1.4 |

| | | |
|-----------------------------|--|---|
| | | <ul style="list-style-type: none"> Wellbeing – improved from 1.4 to 1.3 |
| Overall | <ul style="list-style-type: none"> Biggest HR and PROM improvements from Phototherapy & Massage combined session. Owner pleasantly surprised at overall improvement in mobility and how much more relaxed she seemed. Also noted by family members. | |
| From Start to Finish | <p>Movement</p> <ul style="list-style-type: none"> L (improved flex by 5° & ext by 7°) R (improved flex 11° by & ext 8°) <p>Wellbeing</p> <ul style="list-style-type: none"> HR decreased by 21 BPM <p>Owner Feedback</p> <ul style="list-style-type: none"> Movement – improved from 2.7 to 1.4 Wellbeing – improved from 2.0 to 1.3 | |



Group 2 – Phototherapy Only

Case Study 4

Description

- Black Labrador - Male
- BCS 4
- Lameness Score 1
- Weighs 27kg
- 9 Years old
- Owner had from puppy.
- Hydrotherapy monthly

Lifestyle

- Lives with 2 other dogs, caring owners (couple) and family of teenage sons and Mother.
- Exercised 2-3 times a day, up to 20 minutes. Mixture of on and off lead. Mainly on grass, rarely jumps in/out of car.
- Rest of time usually snoozes on bed/sofa.

History

- OA diagnosed aged 6 years old.
- No medication. On YuMove, which owners say has made a difference.
- Fed high quality kibble.



My Assessment

- Can be anxious and unsure of anything or anybody “new”.
- Pants when stressed.
- Quite bouncy and comfortable in walk and trot. Rarely canters.
- Paddle forelimb gait.
- Muscle atrophy around biceps, triceps, most notable on front right.
- Tension around elbows, shoulders bilaterally.

| Group 2 – Case Study 4 | Treatment | Outcome |
|--|---|--|
| Session 1 – Measurements Taken Only | Needed lots of comforting from owner | |
| Session 2 – Phototherapy Only | <ul style="list-style-type: none"> • Very unsure when measurements being taken • Didn't enjoy Photizo beeps | <p>Movement</p> <ul style="list-style-type: none"> • L (improved flex by 10⁰ & ext by 7⁰) • R (improved flex by 10⁰ & ext by 8⁰) <p>Wellbeing HR decreased by 21 BPM</p> <p>Owner Feedback</p> <ul style="list-style-type: none"> • Movement – No change from 1.0 • Wellbeing – No change from 2.0 |
| Session 3 – Massage Only | <ul style="list-style-type: none"> • As previous session re measurements taken. • Didn't enjoy being handled initially, eventually relax when reassured by owner. | <p>Movement</p> <ul style="list-style-type: none"> • L (improved flex by 5⁰ & ext by 3⁰) • R (No change flex & improved ext by less than 2⁰) <p>Wellbeing HR decreased by 19 BPM</p> <p>Owner Feedback</p> <ul style="list-style-type: none"> • Movement – No change |

| | |
|-----------------------------|--|
| | <ul style="list-style-type: none"> Wellbeing – No change |
| Overall | <ul style="list-style-type: none"> Biggest PROM and HR improvements from Phototherapy only session. Generally, doesn't enjoy having hands on therapies. |
| From Start to Finish | <p>Movement</p> <ul style="list-style-type: none"> L (improved flex by 10° & ext by 7°) R (improved flex 8° by & ext 7°) <p>Wellbeing</p> <ul style="list-style-type: none"> HR decreased by 13 BPM <p>Owner Feedback</p> <ul style="list-style-type: none"> Movement – stayed the same Wellbeing – stayed the same |



Case Study 5

Description

- Golden Retriever - Male
- BCS 8
- Lameness Score 2
- Weighs 38kg
- 10 Years old
- Rehomed 2 years ago with Case Study 3
- Never had any form of therapy

Lifestyle

- Same as Case Study 3.

History

- Not much known about previous health history.
- OA diagnosed when new owners first took her to Vet when rehomed.
- No medication. On YuMove, owners state has made a difference.
- Fed medium quality kibble.



My Assessment

- Very chilled out dog who loves attention. Lovely nature.
- Looks stiff in movement and awkward due to being overweight.
- In walk, all limbs look stiff, no movement in lumbar/sacral.
- Elbows feel thick, tension around both elbows, shoulders and thoracic.
- Right side most affected.

| <u>Group 2 – Case Study 5</u> | <u>Treatment</u> | <u>Outcome</u> |
|--|---|--|
| Session 1 – Measurements Taken Only | Enjoyed attention | |
| Session 2 – Phototherapy Only | <ul style="list-style-type: none"> • Needed comforting before applying Photizo. • Tolerated session well • Immediately went to sleep | <p>Movement</p> <ul style="list-style-type: none"> • L (no change in flex & ext improved by 7⁰) • R (improved flex by 3⁰ & ext by 10⁰) <p>Wellbeing HR decreased by 4 BPM</p> <p>Owner Feedback</p> <ul style="list-style-type: none"> • Movement – improved from 2.9 to 1.4 • Wellbeing – improved from 2.0 to 1.0 |
| Session 3 – Massage Only | Fell asleep quickly | <p>Movement</p> <ul style="list-style-type: none"> • L (improved flex by 5⁰ & ext by 20⁰) • R (improved flex by 5⁰ & ext by 10⁰) <p>Wellbeing</p> <ul style="list-style-type: none"> • HR decreased by 12 BPM <p>Owner Feedback</p> <ul style="list-style-type: none"> • Movement – improved from 1.4 to 1.3 • Wellbeing – remained the same at 1.0 |
| Overall | <ul style="list-style-type: none"> • Biggest improvements from Massage only session. | |

| | |
|------------------------------------|--|
| | <ul style="list-style-type: none"> • Out of all the dogs who took part, saw the biggest overall improvement margins • Owner very surprised with improvement in how he appeared in himself and improved movement. |
| <u>From Start to Finish</u> | <p>Movement</p> <ul style="list-style-type: none"> • L (flex no change, & improved ext by 33°) • R (improved flex 13° by & ext 27°) <p>Wellbeing</p> <ul style="list-style-type: none"> • HR decreased by 3 BPM <p>Owner Feedback</p> <ul style="list-style-type: none"> • Movement – improved from 2.9 to 1.3 • Wellbeing – improved from 2.0 to 1.0 |



Case Study 6

Description

- Golden Retriever - Male
- BCS 5
- Lameness Score 1
- Weighs 28kg
- 5 Years old
- Rehomed 1 year ago.
- Never had any form of therapy

Lifestyle

- Lives with owners (couple), both work from home.
- Only pet in the house.
- Walked upto 30 minutes twice daily, on extendable lead, in quiet fields/woodland.
- Rest of time has access to garden, usually snoozing in garden, various beds or sofa. Not allowed upstairs.



History

- Not much known about previous health history.
- OA diagnosed in elbows and hocks by charity vet before new owners rehomed.
- No medication. On YuMove since was rehomed.
- Raw diet.

My Assessment

- Very loving dog, but anxious and needs reassurance.
- Subtle front right and hind left lameness in trot, not obvious in walk.
- Muscle atrophy around hamstrings and quadriceps indicating OA in hocks more affected than elbows.
- Main tension around right elbow, shoulders and mid thoracic.

| Group 2 - Case Study 6 | Treatment | Outcome |
|--|--|--|
| Session 1 – Measurements Taken Only | | |
| Session 2 – Phototherapy Only | Enjoyed the attention, immediately relaxed | Movement <ul style="list-style-type: none"> • L (flex improved by 5° & ext improved by 5°) • R (improved flex by less than 2° & ext by 7°) Wellbeing HR decreased by 4 BPM Owner Feedback <ul style="list-style-type: none"> • Movement – improved from 1.7 to 1.6 • Wellbeing – improved from 1.4 to 1.3 |
| Session 3 – Massage Only | Immediately fell asleep | Movement <ul style="list-style-type: none"> • L (no change in flex & improved ext by 8°) • R (improved flex by 3° & ext by 9°) Wellbeing <ul style="list-style-type: none"> • HR decreased by 8 BPM Owner Feedback <ul style="list-style-type: none"> • Movement – improved from 1.6 to 1.3 |

| | | |
|-----------------------------|---|---|
| | | <ul style="list-style-type: none"> Wellbeing – improved from 1.3 to 1.0 |
| Overall | <ul style="list-style-type: none"> Owner commented on how much more attentive he was after first session which continued throughout Highest improvements from massage only session. | |
| From Start to Finish | <p>Movement</p> <ul style="list-style-type: none"> L (improved flex by 4⁰, & improved ext by 2⁰) Right (improved flex 5⁰ by & ext 11⁰) <p>Wellbeing</p> <ul style="list-style-type: none"> HR decreased by 12 BPM <p>Owner Feedback</p> <ul style="list-style-type: none"> Movement – improved from 1.7 to 1.3 Wellbeing – improved from 1.4 to 1.0 | |

