What are the most common musculoskeletal issues of the UK and Irish

Retired Track Greyhound and how can these be helped and prevented.

Submitted for The College of Animal Physiotherapy Diploma in Animal Physiotherapy



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# **Acknowledgements**

Thank you to every Track Greyhound who featured in my research – you are such amazing dogs.

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David 05/05/05 - 31/05/18



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# **Introduction**

Racing greyhounds have for the purpose of competitive racing for centuries. This selective breeding has influenced the biochemical properties of racing greyhounds as well as their musculature and appearance.

I am conducting official research into the musculoskeletal health of retired racing greyhounds. I would like to understand if there could be a link between racing and the premature onset of musculoskeletal issues, and if so, what are the issues and can they be prevented or managed more effectively in retirement. Professionally I have been working as a Galen Canine Myotherapies for 6 years, and for the past year studying to become an Animal Physiotherapist. Within this time, I have seen many musculoskeletal issues in ex Racing greyhounds so have a professional interest in understanding this more. Personally, I have owned an ex-racing greyhound who sadly was euthanised due to musculoskeletal issues after battling arthritis from the age of seven. I am also a trustee of a local greyhound charity. I would like to be able to shape the future health of these dogs with this research. Having a better understanding of this would help me assist owners who rescue retired racing greyhounds. Potentially preventing as many musculoskeletal issues arising and limit the number of dogs who get returned to the charity as people feel they will be too expensive to care for.

# History of the Greyhound

The Hebrew phrase translated as 'greyhound' means 'girt on the loins.' Translators considered this the most appropriate English term to describe the greyhound.

The modern Greyhound is strikingly similar in appearance to an ancient breed of sighthounds that appear in temple drawings in Turkey dating back to 600BC. A 400BV funerary vase found around modern Iran was decorated with images much like greyhounds. Since ancient artists tended to use only images of religious or social significance these dogs must have been very important indeed. It is thought these were the modern greyhounds' ancestors. The modern greyhound as we know it originated from the middle east. It is thought they are a cross between the domestic dog of that era and the southern European wolf.

The modern Greyhound's earliest history goes back to the bible (*proverbs 30:29-31, King James version*). The greyhound is described as 'the strongest of beasts and turneth not away from any,' the Greyhound is the only breed to be mentioned, specifically in the bible.



Source: GreyhoundsEgypt.png, (gpaindy.org) accessed 05/04/22

Following this their early history dates to ancient Egyptian times four thousand years ago. The Egyptians learnt how to domesticate the dog initially for hunting, but evidence suggests also as companion animals. Greyhounds were associated with royalty and higher up classes; mummified greyhounds have even been found in Egyptian tombs. Greyhounds were held in such high esteem that their birth was only second in importance to having a son. In ancient Greece greyhounds have been mentioned in Homers famous story, "The Odyssey," when returning Odysseus is not recognised by anyone accept his trusted Greyhound Argus.



Source: GreyhoundsEgypt.png, (gpaindy.org) accessed 05/04/2022

Due to their hunting capabilities Greyhounds have been at man's side for the rest of human history. By the Middle Ages, the Greyhound was owned by the higher people of society and were deemed a good asset. This is how they remained for a few centuries, until industrialisation in Brittan. At this time, they were still very popular among the rich and famous and not used for hunting in particular instead more of a statement companion animal. It was at this time wealthy businessmen used to get together and race their dogs for fun, with the odd bet being thrown in – at this time on a straight track. This overtime moved into the more commercial sport with the public watching and people placing bets. Due to the popularity of the sport and the good income generated it soon filtered to different countries worldwide becoming popular in Australia and the US.

Alan Bowman, a Brief But Fascinating History Of The Greyhound Breed, March 20, 2018 by Alan Bowman, internet: (easybreezefarm.com), accessed 04/04/2022.

Roy Genders, 1982, The Encyclopaedia of greyhound Racing, England, Pelham Books Ltd.

### Greyhound Racing History

There are two forms of greyhound racing, Track Racing Greyhounds where greyhounds are raced around a track chasing a mechanical lure. Coursing Greyhounds where they are set upon a hare, normally in fields, catching prey by speed and sight (opposed to scent). Coursing has been banned in most countries and this project will focus on the UK and Irish Track Racing Greyhound.

In 1014, King Canute of England enacted the Forest Laws, which stated that only noblemen could own and hunt with greyhounds.

In the 1500s, Queen Elizabeth I abolished this law and later initiated the first formal rules of greyhound coursing. Greyhound racing then became known as the "Sport of Queens". In the early 1900s, huge crowds would gather to watch greyhound coursing. In the interest of safety, enclosed courses were introduced. These enclosed courses were much smaller than the open courses and speed over agility was of utmost importance. By 1926 the first Greyhound racing track BELLE VUE Manchester opened. Today we have twenty-three active stadiums in the uk and sixteen in Ireland, but over the years there have been as many as 33 in London alone when the sport was at its most popular.

Shortly after Greyhound racing started in 1928 The National Greyhound Racing Club was formed and this body would be responsible for regulation, licensing, and the rules of racing. In 1972 the National Greyhound Racing Club and National Greyhound Racing Society amalgamated to form one controlling body called the National Greyhound Racing Club. They would continue to govern the sport until 2009 when they merged with the British Greyhound Racing Board and a new organisation was born called the Greyhound Board of Great Britain. The remit was the same regarding rules and regulations and the promotion of the sport but there were some extra responsibilities. The issue of welfare is now high on the agenda, and it was vital to demonstrate the welfare standards of the dogs. Greyhound racing was starting to become less popular due to increasing concern over welfare and the set-up of welfare groups. Thankfully, welfare is now high on the agenda of the GBGB, and its tracks and trainers all have a responsibility to rehome the retired greyhounds with many tracks having links with charitable organisations that do this. There is a fund available for dogs who sustain injuries while racing through the GBGB. This had led to the rise of greyhounds who are now domestic pets and companion animals in the UK. My study has focussed on these dogs and the potential musculoskeletal issues they may face in retirement, within a domestic setting. According to the reports issued by the GBGB 7085 greyhounds retired in 2020 and 5484 were rehomed to a domestic setting. Understanding the potential musculoskeletal impacts and how we can prevent/minimise these issues will have far reaching effects to thousands of dogs.

# **Bloodlines**

In 1926 when racing started most of the track greyhound's bloodlines were from the great coursing dogs, such as Jamie (sire of first track star, Entry Badge), Mutton Cutlet, Danielli and Inler who all appeared at Wembley in the first years of track racing. These dogs were the foundation sires of the sport. Inler passed his incredible speed to Tanist and to the bitch Inler May. She went onto be the dam of many magnificent greyhounds. It was the continuation of these bloodlines that produced a number of great track dogs. There had to be careful consideration to how well the sire and Dam would 'knit' together to make a good track dog. An outstanding track dog needs to have not only speed, but flexibility, good track position, stamina, and resilience. Bitches have exceptional stamina and win more often over longer distances and dogs are proven to be better sprinters – this is due to the biomechanical aspects of their body that differ due to sex. It is said that the bitch will overall have greater influence over the whelps due to her body doing most of the work.

Today and over the last 20 years greater attention has been given to combining bloodlines to produce the best dogs. Sires and Dams can be chosen from stock around the world, due to this careful selection there are more good racing greyhounds than ever before. The best track dogs now have coursing lines going back to 4<sup>th</sup> and 5<sup>th</sup> generations, breeders no longer breed from coursing dogs to like they did 60 years ago. Coursing dogs are set in fields upon live game, they need to have slightly different skills to that of a track greyhound. They are thicker set and have more resilience due to being set upon live game. I wonder if the separating of these bloodlines may have a bearing on injuries or the long-term impacts of racing on their body. I am very keen to find out with this project.



Greyhound data, 2022, Pedigree of Jamie, accessed 05/04/2022 (greyhound-data.com)



Greyhound data, 2022, Pedigree of Tanist, accessed 05/04/2022 (greyhound-data.com)

Roy Genders, 1982, The Encyclopaedia of greyhound Racing, England, Pelham Books Ltd, ppp27, 28, 29

Barbara Thompkins & Pam Heasman, 1988, All about the racing Greyhound, england, Penguin Books, PP 98 & 99

# **Biomechanics of the Greyhound**



Greyhounds are built for speed over endurance. They are long and slender and can reach speeds up to 18.5 meters per second (67kn/h) and can run an 800-meter race in less than 60 seconds. They are the fastest of all dogs. When running at maximum stride frequency they can take up to four strides per second. As a comparison word record sprinter Usain Bolt can cover 10.4 m meters per seconds. Its also very interesting that Greyhounds can reach their maximum speed from static within 6 strides. They can do this because the cross-sectional area of the muscle fibres within the leg is much greater than that of other dogs. The proportion of type II muscle fibres is also significantly higher too. In a study by Dobson et al. (1988) it was found that within the Biceps Femoris M, Vastis Lateralis M and Gastrocnemius M there are 90% type II rapidly contracting fibres, which is higher than all other dogs. Lactic acid content of the blood caused up by anaerobic metabolism builds up to sixteen times higher than at resting levels and 6-7 times higher in the muscles themselves. The PH levels can also become more acidic after a race.

*P.S Guy, DH Snow,2018, Skeletal muscle fibre composition in the dog and its relationship to athletic ability, https://www.sciencedirect.com/science/article/abs. Accessed 08/04/2022,* 

The forces on the greyhounds when running are immense, ground reactional forces are around 50% higher in the forelimbs than the hind limbs. The peak vertical force is reached by the forelimbs in the middle of stance phase and by the hind limbs much earlier. The forelimbs decelerate more sharply and for longer than the hindlimbs. Could this have a bearing on their long-term musculoskeletal health?

The Racing greyhound must accelerate from standing to a full speed rotary gallop very similar style to that of the cheater (the fastest mammal on earth). To do this they have to push off with both rear legs simultaneously. The rotary gallop is when the feet land in a circular fashion FL - FR - BR -

BL. Like a cheater in this gallop there are two flight phases – fully stretched and tucked up. The ratio is: FL-FR -tucked flight - BR BL - stretched flight. The cheater can run up to 130 km/h, there is not vast differences in their biomechanics however cheaters are able to alter their stride length and Greyhounds keep it consistent according to research by the RVC. Could the forces places upon certain joint structures have a baring here?

Maximum running speed is constrained by the speed at which the limbs can be swung forwards and backwards, and by the force they can withstand while in contact with the ground. On entering a tight bend, greyhounds do not change their foot-contact timings, and so must withstand a 65% increase in limb forces. This supports the idea that greyhounds power locomotion by torque about the hip - the muscles that provide the power are mechanically divorced from the structures that support weight. Could this have a bearing on musculoskeletal issues in the retired greyhound?

UK and Irish track length is typically run 464M or 659M on the flat. Track greyhounds normally start to train by the age of 12M and can be on the track from 14M of age. Growth plates close around 18M of age. Between the age of 12M and 18M it is possible for a greyhound to have run many races by this point. The growth plates are much softer than other regions of the bones, therefore are more prone to injury which is concerning from a welfare perspective.

For example, the dog below Kereight John, DOB 01/08/2020, started racing at 14M old according to <u>www.greyhound-data.com</u> (stats below). Since then, he has raced eighteen times in 4 months and some races just days apart. The impact on the fragile growth plates could be considerable for this dog. Could this have a baring on musculoskeletal health of the track greyhound?

Date v	<u>Stadium</u>	Dist m	/y (	Grade	Dogs	Trap	Stime Posts	Fin	Comment	Pts	Sp	kg	Winner	WinTm	Time	ETime F	Form Fil
26 MAR 2022	<u>Yarmouth</u>	462/5	05 C	OPEN	6D	T6	5.67	3rd	Wide,VW2		4/1	32.00	Drumdoit Lucy	28.34	28.58	28.48	81
19 MAR 2022	<u>Yarmouth</u>	462/5	05 🤆	GR A2.	6D	T5	5.56	2nd	WideCrd 1/4,VW2		6/1	32.00	<u>Hayley Girl</u>	28.45	28.51	28.31	89
14 MAR 2022	<u>Yarmouth</u>	462/5	05 🤆	GR A2.	6D	T6	5.56	2nd	Wide,Crd 1/4,VW2		10/1	32.00	The Other Lottie	28.13	28.29	28.49	80
2 MAR 2022	<u>Yarmouth</u>	462 / 5	05 G	GR A2.	6D	T5	5.58	6th	Mid- W,Crd1,Blk&Fll3		8/1	32.00	<u>Fizz</u>	28.23			
23 FEB 2022	<u>Yarmouth</u>	462/5	05 🤆	GR A2.	5D	T5	5.55	3rd	Wide,Crd1		3/1	31.50	Stockton	28.40	28.69	28.69	70
16 FEB 2022	<u>Yarmouth</u>	462/5	05 0	GR A3.	6D	T6	5.56	1st	Mid-W,Ld3		10/3	31.00	Kereight John	28.50	28.50	28.40	85
12 FEB 2022	<u>Yarmouth</u>	462 / 5	05 🤆	GR A3.	6D	T5	5.59	2nd	Mid- W,W2,Crd3,RanOn		6/1	31.00	<u>Our Number</u> Four	28.81	28.94	28.74	68
2 FEB 2022	<u>Yarmouth</u>	462/5	05 🤆	GR A3.	6D	T6	5.55	5th	Wide		8/1	30.75	The Other Lottie	28.18	28.52	28.72	69
29 JAN 2022	<u>Yarmouth</u>	462 / 5	05 G	GR A3.	6D	Т6	5.55	2nd	Wide,ChlRunIn		9/1	30.25	<u>Woodhaven</u> Forest	28.60	28.64	28.44	83
24 JAN 2022	<u>Yarmouth</u>	462/5	05 0	GR A3.	6D	T5	5.56	4th	Mid-W		15/2	30.50	Im a Dreamer	28.48	28.65	28.65	72
19 JAN 2022	<u>Yarmouth</u>	462/5	05 🤆	GR A3.	6D	T5	5.57	6th	SAwMid-W,VW2		9/1	30.25	Tusken Raider	28.54	28.95	28.85	62
12 JAN 2022	<u>Yarmouth</u>	277/3	03 🤆	GR D2	6D	T6		5th	SAwW		10/1	30.50	Decoy Woody	16.95	17.30	17.15	22
8 JAN 2022	<u>Yarmouth</u>	462/5	05 🤆	GR A5	6D	T6	5.65	1st	Wide,Ld2		2/1	31.00	<u>Kereight John</u>	29.14	29.14	28.44	83
3 JAN 2022	<u>Yarmouth</u>	462 / 5	05 G	GR A5	6D	T5	5.53	5th	Mid-W,VW2,Crd 1/4		6/4F	31.25	<u>Tranquil Vista</u>	28.72	29.09	28.89	60
26 DEC 2021	<u>rarmouth</u>	462/5	05 🤆	GR A7	6D	T5	5.56	1st	Mid-W,Ld 1/2		6/4F	31.25	Kereight John	29.19	29.19	28.79	65
20 DEC 2021	<u>Yarmouth</u>	462/5	05 0	GR A7	6D	T5	5.64	2nd	Mid-WCrdVW2		15/8F	31.25	Take Off Star	28.75	29.09	29.09	50
15 DEC 2021	<u>Yarmouth</u>	462 / 5	05 G	GR A7	6D	T4	5.68	2nd	Mid- W,VW2,ChlRnIn		15/8F	30.75	Take Off Libby	29.07	29.17	29.17	46
4 DEC 2021	<u>Yarmouth</u>	462 / 5	05 0	GR A7	5D	тз	5.71	4th	Mid,VW2		9/2	30.00	<u>Move Over</u> Frank	29.24	29.78	29.18	46

Greyhound data, 2021, '18 races of Kereight John', available at www.greyhounddata.com, accessed 01.04.2022

# Lifestyle and welfare

From research I have conducted I have found Greyhounds live in a kennel for most of their racing life and owned by their trainers, depending on the trainer their lifestyle may vary – they are not treated like domesticated pets but looked after and exercised daily at the kennels. They are used to being around other greyhounds which indicates why they are normally very good with other dogs.

The GBGB has a greyhound commitment and eight-point agenda 'putting the greyhound welfare at the heart of the sport.' The agenda states:

- Greyhound welfare and safety is at the heart of everything we do.
- Every racing greyhound is treated with respect and care throughout their career.
- Our Independently verified injury rates remain the lowest in the world and will improve further still.
- Wherever possible, every dog leaving racing will enjoy a long and happy retirement.
- Every Race is run fairly and attending a race meeting is enjoyable and fun experience.
- Those working in the sport have access to training at the beginning of their careers and ongoing, accredited professional development.
- Funding received from the industry significantly contributes to greyhound welfare.
- Together, we continue to promote our sport and nurture the publics love of greyhounds.

All dogs are vet checked by a vet prior to racing and a vet is onsite at every meeting and procedures are in play at each track for welfare. Do they have physiotherapists on site? There is no mention in any racing literature that any physiotherapist at the track nor have I seen any 'warming up' of the dogs prior to the race or colling down after. I have been conducting research at my local track in Great Yarmouth and nationally via the internet. Quite often in my opinion the dogs which are racing are already showing signs of musculoskeletal issues when they are being paraded.

The Greyhound Board Of Great Brittan, The Greyhound Commitment third annual update 2022, Available at GBGB.org.uk, Accessed 12/04/2022

# **Previous research**

Much research has been done regarding racing greyhounds and their performance over the years but there is not much research into the retired greyhound post racing. The GBGB publish statistics which are very interesting relating to the Greyhounds retirement data for 2021. They record the dogs which have gone into retirement, the reasons why and re-homing data. The report states that in 2020 there were 3575 track injuries recorded and as a result these dogs were put into retirement.

The injuries were: Hock 624, Carpus 612, Foot 680, Femur 18, Humerus 99, Thoracic limb muscle 381, Pelvic limb muscle 778, other 383.

In 2021, 7089 Track Greyhounds retired in total, meaning that 50.4% were retired with an injury. Of which 613 were retained by the trainer, 5484 went to a Greyhound charity to be rehomed, 765 were rehomed by the trainer and 210 went for breeding and independent racing.

The Greyhound Board Of Great Brittan, Injury, and retirement data 2021, Available at GBGB.org.uk, Accessed 12/04/2022

Other interesting research which focusses on retired track greyhounds - *Greyhounds* under general veterinary care in the UK during 2016: demography and common disorders. This research focusses on the clinical data from primary care veterinary practices. They recorded the reason for mortality in pet greyhounds in 2016. The report states that greyhounds are a common pet accounting for 0.60% of pet dogs. Of 312 recorded deaths the most common cause of death was cancer, collapse, and Osteoarthritis. The Greyhound's median longevity was 11.4 years.

Another study in this report of 2715 Greyhounds who are registered with a primary care vet states - the prevalence of osteoarthritis is more than that of other breeds of dogs as is the increased problems with the foot, nails, and dewclaws. 13.6% of all greyhounds were found to have osteoarthritis during the study period in contrast to 11.8% of other breeds. The report suggests that male greyhounds are affected more as they generally have a longer racing career. This is due to studies which show that females performance decreases significantly at 40 months, so they have shorter careers as a result. The report theorises that their racing career could be the reason these dogs are more likely to have osteoarthritis, foot, and dewclaw problems in retirement.

O'Neill, D.G., Rooney, N.J., Brock, C. et al. Greyhounds under general veterinary care in the UK during 2016: demography and common disorders. Canine Genet Epidemiol 6, 4 (2019). https://doi.org/10.1186/s40575-019-0072-5, accessed 15/04/2022

# **Methodology**

150 owners were surveyed.

I used an online survey tool to collect quantitative research. The tool gave owners the opportunity to fill the survey in on their phone/tablet/laptop. I was able to send the survey out on social media platforms and via email/text. I was also able to also join Greyhound meet ups and fill the survey via tablet or in paper form on behalf of owners – to capture those without technology. The common denominators of my research were English and Irish Track Racing Greyhounds living or have lived in the UK prior to death, dogs of any age and sex.

**Did your Dog Have any pre-existing injures from racing when you rescued them?** Here I wanted to understand how many dogs were starting life in retirement with an injury. If so, is there extra support needed here?

# Question 2

**The Age of the dog I am answering the survey about is – ages 0-15?** I wanted to understand if there was a link between the age of the dog and the onset of conditions. So possible preventative measures can be put in place before the issues arise.

# Question 3

**Has/did your dog develop (ed) any musculoskeletal problems within their life?** This will give me a good indication of the extent of the issue as a whole.

# Question 4

At what age did your dog move to a domestic setting? I wondered if there could be a bearing on musculoskeletal issues relating to the age of when the dog went into a domestic setting. Could they be more prevalent the older/younger the dog is when it goes into retirement?

### Question 5

**If your dog has/did develop/ed any musculoskeletal issues what best describes the first issue they had/have had.** Here I have listed; arthritis, ongoing lameness, cruciate ligament rupture, hip problems, elbow problems, hock problems, spinal problems, other ligament/tendon problems, foot toe problems, carpus/wrist problems, stifle problems, shoulder problems, head/neck problems and other. I was very conscious here to write this question in such a way to get specific accurate information, but also for the reader to be able to answer the question with no veterinary knowledge. I asked for advice from greyhound owners and adapted before launching the survey.

### Question 6

What age did they first develop symptoms? I wondered if age could have a common theme here and had a significant baring on the onset of musculoskeletal issues.

### Question 7

**Did your greyhound have any further musculoskeletal issues within their life – tick all that apply.** (Choices same as question 5) It is Really important I have the full picture and understand all of th secondary conditions our Greyhound can be faced in addition the primary so I can implement positive change.

**If your dog has passed away, was it as a result of a musculoskeletal problem?** Here I wondered if there could be a link with premature onset of death and the track greyhound's musculoskeletal health. I could compare statistics of the deaths of other breeds of dogs to establish if there is a link.

Question 9

# Please give more information about your dog's condition/s. Please state the condition if

**you know it.** I wanted to be able to drill into the detail of information further to find links to the actual conditions. In addition, give people who were unsure the opportunity to explain the condition so I could make sure it appeared in the statistics.

# The results

150 retired track greyhound owners were surveyed from the UK.

# Question 1

# Did your Dog Have any pre-existing injures from racing when you rescued them?



ANSWER CHOICES	RESPONSES
Yes	40.67%
No	41.33%
Not sure	18.00%

# The Age of the dog I am answering the survey about?



ANSWER CHOICES	RESPONSES
Sadly deceased	17.33%
Aged between 0-2	0.67%
Aged between 2-4	12.00%
Aged between 4-6	18.67%
Aged between 6-8	22.00%
Aged between 8-10	18.00%
Aged between 10-12	10.00%



# What age did your greyhound move to a domestic setting?



ANSWER CHOICES	RESPONSES	
0-12 months	0.00%	
1	1.79%	
2	12.50%	-
3	33.93%	
4	28.57%	
5	10.71%	
6	3.57%	-
7	3.57%	-
8	3.57%	-
9	1.79%	-

other ligament/tendon problems

Foot or toe problems

Wrist (Carpus) problems

Head/neck or face problems

Knee (stifle) problems

Shoulder problems



7.14%

12.50%

14.29%

1.79%

3.57%

1.79%

10



3.57%



10		- 1
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ANSWER CHOICES	RESPONSES
None just the one issue on the previous question	34.55%
Osteoarthritis	27.27
ON-going lameness	12.73%
Cruciate ligament rupture	0.00%
Hip problems	3.64%
Elbow problems	1.82%
Hock Problems	1.82%
Spinal Problems	9.09%
Other ligament/tendon problem	1.82%
Foot or toe problem	7.27%
Wrist (carpus issue)	10.91%
Knee (Stifle) issue	0.00%
Shoulder problems	3.64%
Head/neck/face issues	7.27%

Has your dog sadly passed away? If so, was it as a result of a musculoskeletal problem?



ANSWER CHOICES	RESPONSES
Yes	35.00%
No	65.00%

Please give more information about your dog's condition/s. Please state the condition if you know it.

broke her back racing and rehab and raced again 3/15/2022 7:04

AMV

Osteosoma of the rib cage 3/14/2022 7:24 AM

Fractured leg from racing causes limping 3/14/2022 7:03 AMV

It was a spinal problem at the base of the neck with a protruding disc. Took several X-rays and scans to diagnose it. 3/13/2022 10:43 PM

Shaky back legs and stiffness, suspected arthritis and/or neurological or spinal problems 3/13/2022 8:38 PM

*This is Miller so you are in a better position to answer this by your records 3/6/2022 7:23 PM* 

He twists his ankle a fair bit, and that's due to racing the vets said (and coursing) but we are careful when we run him in his field so no many problems now 3/6/2022 10:25 AM

Billy also had dropped wrists. Heart murmur grade 4 and he also had panis which made his eyesight really bad 3/5/2022 3:30 PM

General lameness, stiffness in back legs and shoulder/neck and wrist pain. 3/4/2022 11:09

*He had a broken wrist and now limps. He walks stiffly for a while after lying down a long time 3/1/2022 7:10* 

Lower back tissue damage affects his back legs! Stiffness & cramps! Back legs seem weak at times 3/1/2022 7:32 AM problem from being hit with stick or similar across her back 2/28/2022 2:33 PM

He had this problem with his wrist. It became steadily worse despite vet

#### **Conclusion**

The results are very interesting. We know from the data published by the GBGB, in 2021 just over 50% of dogs were retired due to an injury and in 2020 this was a staggering 76%. This is very high considering the number of races were very restricted due to the national lockdown. 40.67% of owners in my survey stated their dog did have a pre-existing injury and 18% was not sure. This reflects the data from the GBGB. Quite worryingly it means 50% of our retired greyhounds already may have considerable compensatory issues in addition the injury if they have not had adequate rehabilitation. On balance the GBGB does have a Greyhound Commitment and is putting the welfare of all dogs at the heart of the sport but there is no mention of physiotherapy and rehabilitation for injuries and compensatory issues.

In my survey there was a wide range of ages, of which overall 45.33% all had musculoskeletal issues within their lifetime. However, if you filter this by age it tells a more prevalent story.

	% Which have had a musculoskeletal issue
Age	within their lifetime
0 to 2	0
2 to 4	33
4 to 6	31
6 to 8	34
8 to 10	52
10 to 12	48
Over 12	100%
Deceased	66%

There is a big jump from 8 years old and all the dogs over twelve went onto develop a musculoskeletal issue within their lifetime. Primary conditions which were most prevalent are arthritis (24%) which is almost expected but a surprising result is the issue with the carpus of 12%. Adding that to the issues of the foot, toe, and hock – these lower limb issues are most prevalent (31%) which is a surprising result. Interesting we almost expect arthritis because much has been written about it in human and canine athletes, I also expected more issues within the hips as these seem to be the 'powerhouse' of the gallop. As a secondary

condition 28% went onto develop arthritis. Carpus issues were 10%, added together with foot, toe and hock conditions this equates to 31% as an accumulative.

Interestingly there are exceptionally low numbers of cruciate ligament rupture and elbow issues - just 2% as a secondary condition for both (each). This is remarkably interesting and if we could understand why these athletic dogs did not have these issues, we may be able to help the community of owners whose dogs are predisposed to these conditions.

Unexplained ongoing lameness seemed to increase from 7% as a primary condition to 12% as a secondary condition which may be due to compensatory issues. Hip issues were only 10% (primary) and 3% (secondary). Although we may expect to see hip issues because of the force of the power is coming from behind. These issues are not a prevalent here perhaps due to the strength in the pelvic limbs, flexibility of the spine and strong supporting structures of the coxofemoral joint. These will be well developed in these athletic dogs.

Death due to a musculoskeletal issue was 35%, this does coincide with other research stating that osteoarthritis is more prevalent in track greyhounds and one of the most common causes of death.

As identified in the research many owners have had issues with the hock and carpus. My research as identified that these issues could occur due to forces placed upon them when running. The horizontal forces into the carpus will be significantly increased as will the ground force the feet will need to withstand. When standing the bodyweight is spread though all its weightbearing bones of the Greyhounds body, when running, the muscles push against the floor to create speed, higher speeds are achieved by applying more force to the ground. This force equates to 2.0 and 2.9 times the bodyweight which mainly impacts the feet and distal limbs. When going round a bend we already know from previous research that the greyhound does not alter its foot contact timings. This results effective weight by 71% and increased peak force of 64.5% in each leg while running on bends. The front legs are responsible for weight baring while the hips, back and spinal extension produce speed. This could be why my research picked up more issues within the carpus.

In contrast the human athlete counter contrasts the effect of bends by increasing contact timings of each foot. The impact of the forces is spread over a longer time and remans constant running on the straight or a bend. Greyhounds can also produce the force to counter propel the centripetal acceleration, therefore no change in contact timings when running on the bends.

Another factor to consider is that greyhounds run counter clockwise, this may cause asymmetrical loading onto the musculoskeletal structures. The bones nearest the inside of the track experiences higher compression stresses while the outside bones are put under higher tensile forces. More research is needed to understand the impact of this and how we can prevent it from happening.

My research has shown that long term chronic carpus injuries are more prevalent than hock? Could it be that the carpus suffers chronic issues due to the long-term impact of racing? Could this be because of the location of the centre of gravity and the fact that the front limbs are weight baring when in rotary gallop.



Greyhound centre of gravity

From the research I have completed I have also ascertained the detrimental impact that de acceleration has on the carpus. The added braking and propulsion forces when slowing down from a rotary gallop will further impact the carpus and distal front limbs which bare the weight. This may also be why there are more chronic carpus and foot conditions. Circumstances where there is little break between races the carpus's joints and structures within them will become over worked, less secure and more prone to injury and hyperextension.

The carpus itself is made up of seven small bones that form a Ginglymus compound joint. Most of the motion is in the Antebrachiocarpal joint (70%). Least is in the Carpometacarpal joint (5%). The supporting structures to the Hocks skeletal system are the Palmar radiocarpal and ulnocarpal ligaments, flexor retinaculum and Palmar Fibrocartilage. The forces places upon these joints and structures constantly are immense and it is no wonder we are seeing lots of problems in the area.

Howard E.Evans & Alexander de Lahunta, 2013, Millers Anatomy of the dog, Elsevier Saunders, Missouri, P136

I believe following this research it is possible that lots of the other musculoskeletal issues and even the onset of arthritis we see within these dogs is because of compensatory issues. The effects of distal limb issues will alter gait, posture, incorrect loading, and stress levels of other associated structures. I believe that most certainly the issues within the shoulder, ongoing lameness in addition arthritis could be linked to the issue with ground forces on the distal limbs and Moreso the carpus.

I wonder if using hock and carpus supports would improve this and feel further research is needed in this area.

#### Areas of further research

- Would the use of hock and carpus support help with the forces placed upon these joints when racing?
- Would regular physiotherapy as early as possible in the Greyhounds career prevent long term issues.
- Would the use of high-quality omega oils assist with long term musculoskeletal health from 12 months old?
- What are the effects of a symmetrical loading from running counterclockwise and what can be done to assist this?
- Is there an impact on Growth plates and long term musculoskeltal health from starting to train at 12M and compete at 14/15.

• Why do greyhounds not seem to suffer from elbow and cruciate issues, could this help other breeds of dog?

### Following this research;

- I have written a fact sheet which will help every new owner of a retired greyhounds care for their musculoskeletal health.
- Once qualified as an Animal Physiotherapist I intend to make a video to accompany the fact sheet which I will use on my social media platform. I intend to send it to all of the rehoming charities for use too. This is a short video explaining three simple techniques aimed at non-professionals (owners) to assist the musculoskeletal system in particular distal limbs and associated compensatory issues. These techniques will be soft tissue massage, the safe use of thermotherapy (heat) and passive range of motion.
- Once qualified as an Animal physiotherapist I will be very keen to promote awareness of these issues and run workshops educating trainers and owners about how they can help their greyhounds musculoskeletal health.
- I have already written to the GBGB to ask about the use of physiotherapists at the tracks and kennels. They already have an eight-point agenda of their commitment; I would like to see that physiotherapy is part of this. Regular physiotherapy sessions for every dog could mean less injuries and less chronic issues in retirement. I would also like to discuss the use of carpus and hock support when running to limit the ground forces placed upon the carpus and hock. The GBGB have acknowledged my email and I am waiting for a response.

[Document title]



- Use a good quality mobility supplement which includes omega oils- (examples are Yumove and good quality salmon oil but check with your vet first and always dose as per the instructions)
- Keep your dog at a healthy weight being overweight will have a negative impact on their mobility
- Add massage, passive movements and theraputic exercises to your daily routine. Consult with an Animal physiotherapist to give you guidance. Give extra attention to the hock, carpus (wrist, ankle) and feet.
- Use rugs on slippery floors and check your home environment for anything your greyhound may find difficult (steps in and out of doors and having to make difficult turns to manuver around furniture are good examples).
  - If your greyhound cannot avoid using stairs, make sure you aid them to get up and down.
    - Use a hock and carpus support when on log walks and when running
      - Keep nails well trimmed
    - Do not play with balls or frizbees -this will cause an injury or longterm damage,
- Don't forget our Greyhounds need mental stimulation as well as physical Brain games and scent work are good options for greyhounds and gentle on their body.
- Avoid repetitive actions and jumping from heights- always assist your Greyhound in and out of the car and off the sofa/bed etc. Be extra aware if they are jumping onto hard slippery floors at home from any height above their carpus (wrist).

Draft of poster I made for owners

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### Picture sources:

Source: GreyhoundsEgypt.png, (gpaindy.org) accessed 05/04/2022

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