

**RCVS KNOWLEDGE
CANINE CRUCIATE REGISTRY
REPORT 2023
VERSION 3**



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To meet its goals, it supports and collaborates with veterinary teams on the ground and in practice. Influences policy. Engages with educators and other organisations.

It translates and disseminates the latest research from across the globe. Fosters approaches to shared learning with training and tools. Logs and tracks the evolving professions, underpinned by the veterinary archive.

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RCVS KNOWLEDGE CANINE CRUCIATE REGISTRY REPORT 2023

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A MESSAGE FROM THE CHAIR OF OUR BOARD OF TRUSTEES

This report you're reading right now is the culmination of two years of hard work, but it started with a simple idea. What if we could build the largest comparative dataset on canine cruciate surgery? If such a thing existed, it would provide veterinary professionals and owners around the world with the evidence they need to navigate clinical decisions with confidence.

Although registries like this are commonplace in human medicine, it hadn't been done at scale before in veterinary science. Canine cruciate surgery seemed like an obvious candidate because it affects one in every 200 dogs, with two thirds of those cases managed surgically. Whilst there was some data on canine cruciate surgery available, it lacked that comparative element that would help professionals weigh up the merits of various techniques for each individual patient. Although we recognised that it would take a lot of time, resource, and effort to make it a reality, we decided the potential benefits far outweighed the necessary commitment. So, in 2021, we launched the RCVS Knowledge Canine Cruciate Registry.

Safe to say, there were some sceptics. Some thought that vets and clients wouldn't participate. However, we were committed to our vision, and the results have been unbelievable. At the time of writing, hundreds of vets are signed up to the Registry, and are using it as part of their day-to-day work, as well as providing data to help it grow.

So how did we get here? Simply put, we set out bold aims and by working collaboratively with a strong team, we are delighted to be well on our way to achieving them.

Our primary aim was to gather evidence so that we could support vets to advance the quality of veterinary care. We have made a strong start towards increasing the evidence base, with hundreds of surgical procedures logged by the professions to date. The Registry can also be used as a clinical audit and benchmarking tool for use by individual veterinary surgeons.

This report marks the first time we are feeding the Registry's data back to you, and subsequent reports will be released annually. It is no exaggeration to say that this would have been impossible without the enthusiasm and diligence of the vets and owners who contributed data on their patients and pets. If you took part, thank you so much for helping this groundbreaking idea become a reality.

Now we look to the future. In the long-term we hope that the Registry will provide a template for how the professions can use technology and collaboration to gather evidence that will have a positive impact on the quality of care. Whilst this project specifically relates to the surgical treatment of canine cruciate ruptures, we intend that the methods of data collection we have pioneered will be used with other disease processes and species.

In the shorter term, we look to our next report in 2024. We hope you'll join us by submitting your own patients' data, and speaking about the Registry to your clients so that they can contribute too. Help us build a living resource that will improve care for animals in the future.



A handwritten signature in black ink that reads "Amanda Boag".

Amanda Boag
Chair, Board of Trustees

A MESSAGE FROM OUR CLINICAL LEAD

I'm delighted to present the first report of results from the RCVS Knowledge Canine Cruciate Registry. The Registry aims to improve the outcomes of canine patients undergoing cruciate surgery, whilst minimising complications.

This prospective longitudinal study combines surgical data with owner reported outcomes on a national scale, for the first time. The amount of data will only continue to grow as more cases are enrolled and we follow up patients over longer time periods. We need to gather data from across the profession incorporating all procedures so we can draw valid conclusions. Using the registry for personal clinical audit also allows transparent conversations with owners about individual complication rates and outcomes rather than simply using data from the literature. Whilst the Registry is not the only way to do this, it does make clinical audit very easy and involves owners in the process. I believe it will become increasingly important over the coming years for us all to be able to justify what we do and the cost of the treatment we provide. Auditing outcomes is one way to do that.

It is beyond the scope of this report to analyse all the data in detail; however, registries are powerful tools to highlight areas that warrant further investigation, either using the data they generate, or in independent studies. This report aims to do that. In order to use the data more widely we aim to define a number of initial research questions in the coming months. We will seek applications from colleagues to work with us to use the data to answer them. We will provide more details in the coming months.

To the veterinary surgeons and colleagues already submitting cases, a huge thank you. This project relies on your continued involvement, and we are grateful for your assistance. Please encourage your colleagues to get involved. Even if you are not performing cruciate surgery the data the registry produces will help with clinical decision making for your patients.

I'm very grateful to both Rhiannon Hornett (Amplitude Clinical Outcomes) and Tim Parkin for their help analysing and interpreting the data.

Thank you to all the team at RCVS Knowledge who have helped produce this report and who continue to help drive this project forward. The support of RCVS Knowledge is vital to the success of this project. In veterinary orthopaedics we are lucky to have this resource available to us. Please help this project grow by enrolling and continuing to submit cases.

A final thank you to all the dog owners who have contributed and continue to contribute data to this project. As well as helping us to monitor the progress of your dog after surgery your support is helping to improve the outcomes of all patients undergoing surgery in the future.



A handwritten signature in black ink, appearing to read 'Mark Morton'.

Mark Morton
Clinical Lead

STEERING GROUP MEMBERS



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The RCVS Knowledge Canine Cruciate Registry Steering Group has been developed to represent a broad spectrum of the veterinary profession.

RCVS KNOWLEDGE CANINE CRUCIATE REGISTRY BACKGROUND

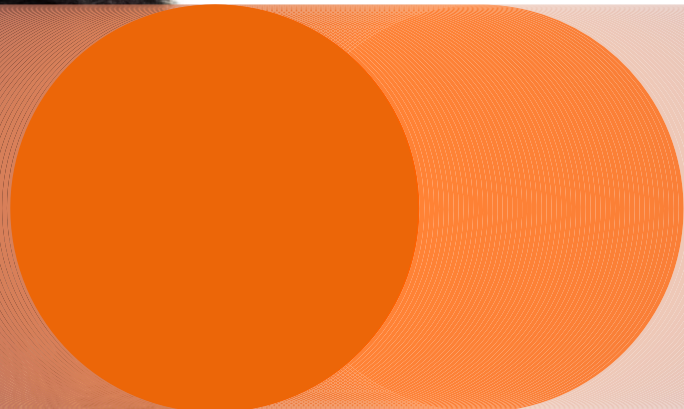
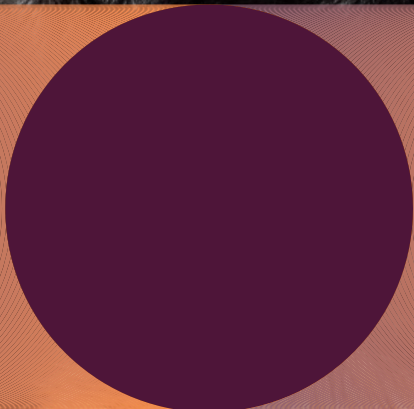
The RCVS Knowledge Canine Cruciate Registry (CCR) launched in July 2021, with the aim of improving canine cruciate patient outcomes and minimising complications, by supporting clinicians to evaluate which surgical techniques and implants are most effective and advance their quality of care.

The CCR is open to any veterinary surgeon in the UK performing any cruciate surgery technique. Outcomes are owner assessed using the Liverpool Osteoarthritis in Dogs (LOAD) ¹ questionnaire and the Canine Orthopedic Index (COI) ².

The CCR is endorsed by the British Veterinary Orthopaedic Association (BVOA).

Surgeons can use the registry to monitor their own patients and can use the inbuilt reporting tools for personal clinical audit. Cases from across the registry are analysed centrally to produce this inaugural report. Data has been collated from the first two years to July 2023.





GLOSSARY

A

Arthroscopy: Examination inside a joint using a small camera.

Arthrotomy: Incision into a joint to allow examination.

C

CBLO: CORA (Centre of Rotation of Angulation) Based Levelling Osteotomy.

CCR: RCVS Knowledge Canine Cruciate Registry.

CCWO: Cranial Closing Wedge Osteotomy.

COI: Canine Orthopedic Index.

CREM: Client Reported Experience Measure.

CROM: Client Reported Outcome Measure.

D

Delegates: Users of the registry that are linked with a registered user. This is often veterinary nurses or non-clinical team members that can access and input data on the registry on behalf of the veterinary surgeon. A veterinary surgeon can also act as a delegate for another veterinary surgeon.

E

ELSS: Extracapsular Lateral Suture Stabilisation, also known as a 'lateral suture'.

L

LOAD: Liverpool Osteoarthritis in Dogs.

M

Meniscus: A cartilage shock absorber inside the knee.

Meniscectomy: Removing part of the meniscus, usually because it is damaged.

MMP: Modified Maquet Procedure.

O

Osteotomy: A cut made in a bone.

P

Pathways: A pathway is equivalent to a cruciate rupture on the Canine Cruciate Registry. Patients can have two pathways to indicate two cruciate ruptures (one of each stifle).

Pathway owners: The veterinary surgeon that has opened the pathway for the patient.

Registered users: Veterinary surgeons who have registered for an account on the Canine Cruciate Registry.

S

Stifle: Canine equivalent of the knee joint.

T

TPLO: Tibial Plateau Levelling Osteotomy.

TTA: Tibial Tuberosity Advancement.

For more information about these terminologies, or cruciate ligament rupture and common surgical procedures visit [caninecruciateregistry.org](https://www.caninecruciateregistry.org).

REPORT SUMMARY

- There are 363 registered users.
- There are 928 registered patients.
- The most common breed was the Labrador Retriever.
- The majority of patients (52%) were of Ideal Body Condition Score.
- There were 735 surgical procedures recorded.
- The majority of procedures performed were osteotomies.
- Regional anaesthesia was used in 83% of patients.
- Almost all patients received peri-operative antibiotics (99.9%).
- Nearly two-thirds (63%) of patients did not receive post-operative antibiotics.
- Adverse events were recorded in 6% of patients, the most common being haemorrhage.
- The majority of owners rated their dog as Much Better than before surgery at subsequent assessments.



1. USER PROFILES

1.1 Users

There were 363 registered users of the CCR. There were 284 veterinary surgeons enrolled with 102 pathway owners. 75 had recorded surgical procedures. There were 78 delegates.

1.2 Professional Designation

56.5% (n=562) of pathways were registered to Advanced Practitioners. 16.2% (n=161) were registered to RCVS Recognised Specialists. Pathways with procedures were distributed in a similar way.

1.3 Experience

Using years since graduation as a measure of experience, the mean experience of pathway owners was 21.3 years (median 21 years) with a range of 1-41.

* This date was calculated using the 'Activity Date' (either the date of the procedure or the date of pathway registration).

1.4 User Pathways

The mean number of pathways per user was 9.8 ± 17.1 (median 24) with a range of 1-115.

1.5 User Procedures

The mean number of procedures per user was 9.8 ± 17.3 (median 26) range 1-103. In users with over 5 pathways on average 68.4% were surgical (median 78.6% range 10-100%).



363
Registered
Users

2. PATIENT NUMBERS

Since launch 928 patients have been enrolled on the CCR. 994 pathways and 735 surgical procedures have been logged.



3. PATIENT DEMOGRAPHICS

3.1 Sex and Neutered Status

Sex was reported in all pathways.

Neutered status was unknown in 4.6% of pathways (**Figure 1** and **Table 1**).

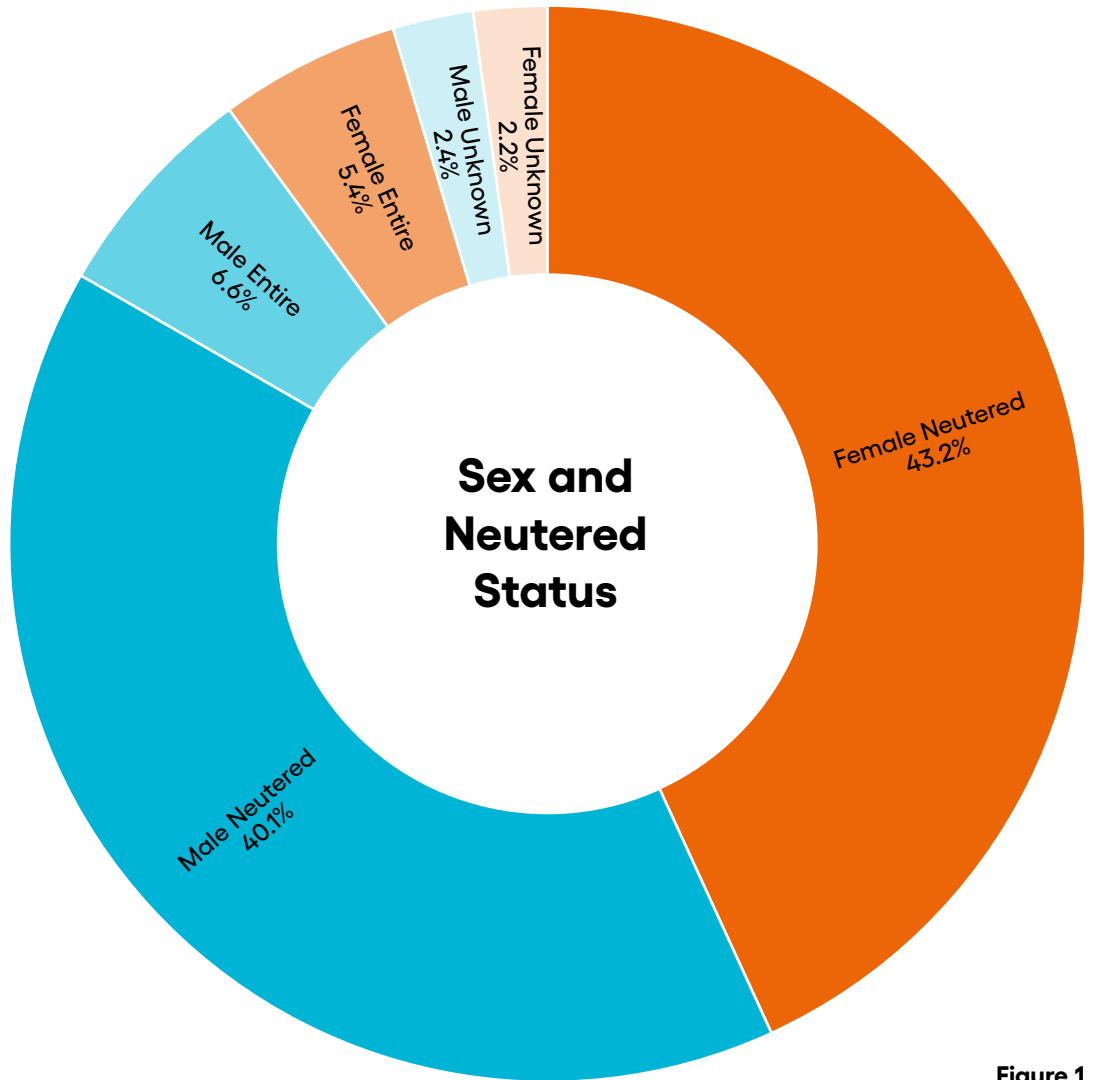


Figure 1

Table 1 - Sex and Neutered Status

	Number (n)	%
Male Entire	66	6.6%
Female Entire	54	5.4%
Male Neutered	399	40.1%
Female Neutered	429	43.2%
Male Unknown	24	2.4%
Female Unknown	22	2.2%
Total	994	100%

3.2 Age

The age of patients was calculated based on their age at the time of the procedure (or at the time of registration if no procedure was performed). Age ranged from 9 months to 15 years. The average age of patients was 7.2 years (median=7 years and 3 months). Age was recorded in 98.8% of pathways (n=982) The age recorded in 3 cases was outside of the biologically possible range so were excluded from this analysis.

3.3 Breed

85 different breeds were reported (n=994). The 5 most common were Labrador Retriever (9.3% n=88), English Springer Spaniel (5.0% n=47), Golden Retriever (4.8% n=45), Cocker Spaniel (4.1% n=39) and Staffordshire Bull Terrier (4.1% n=39). 5.1% of patients were Crossbreeds (n=48) though this figure does not include Crossbreeds that are non-kennel club registerable e.g. Cockerpool, as these are recorded separately. The breed was unknown or not recorded in 10.7% of patients (n=101) (Figure 2).

3.4 Body Condition Score

Most common Body Condition Score was Ideal Bodyweight. Body Condition Score was recorded by the veterinary surgeon following initial patient assessment of 50.2% patient pathways (n = 499) using the Royal Canin 9 point scale³. 0.8% of patients were classified as Too Thin, 52.1% were of Ideal Bodyweight whereas 28.3% were Overweight, and 19.6% of patients were Too Heavy (Figure 3).

Body Condition Score

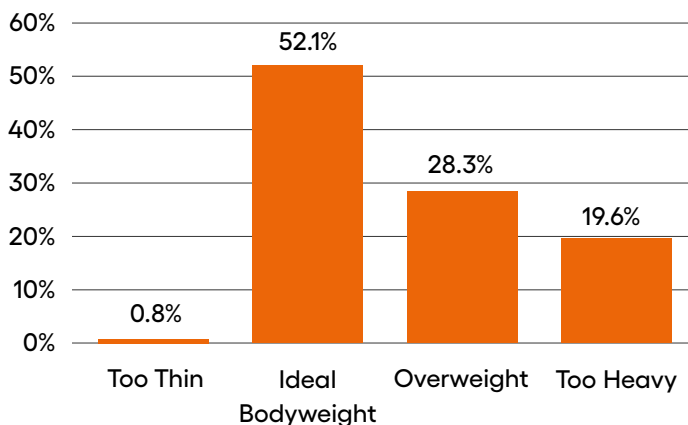


Figure 3

Breed

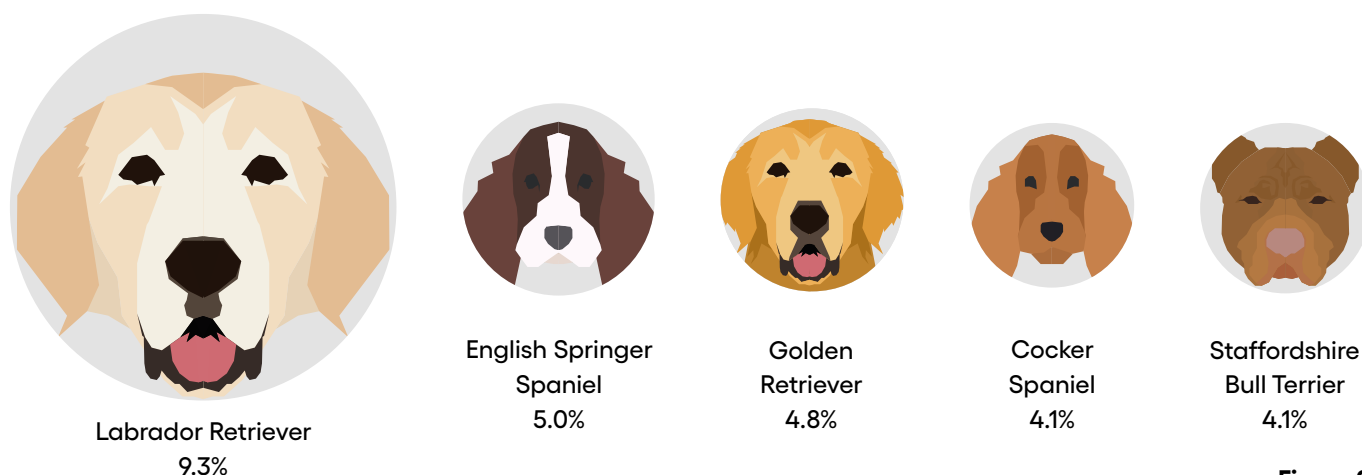


Figure 2

3.5 Body Weight

Body weight was recorded in 69.3% of patient pathways (n=689). The average patient weighed 23.3kg±12.1 (median 21.9) range 1.6kg-80.3kg. Variation by gender and neutered status is displayed in **Table 2**.

3.6 Affected Limb

The affected limb was recorded in 95.9% of pathways (n=953). The left pelvic limb was affected in 48.9%, the right in 42.0% and the remainder affected bilaterally (**Figure 4**).

Table 2 - Body Weight

	Number of patient pathways	Mean ± SD (kg)
Male Entire	44	25.9±13.8
Female Entire	37	29.7±12.6
Male Neutered	280	23.2±12.1
Female Neutered	293	22.2±11.6
Male Unknown	18	20.9±11.7
Female Unknown	17	22.9±13.7

The ages of patients ranged from 9 months to 15 years

Affected Limb

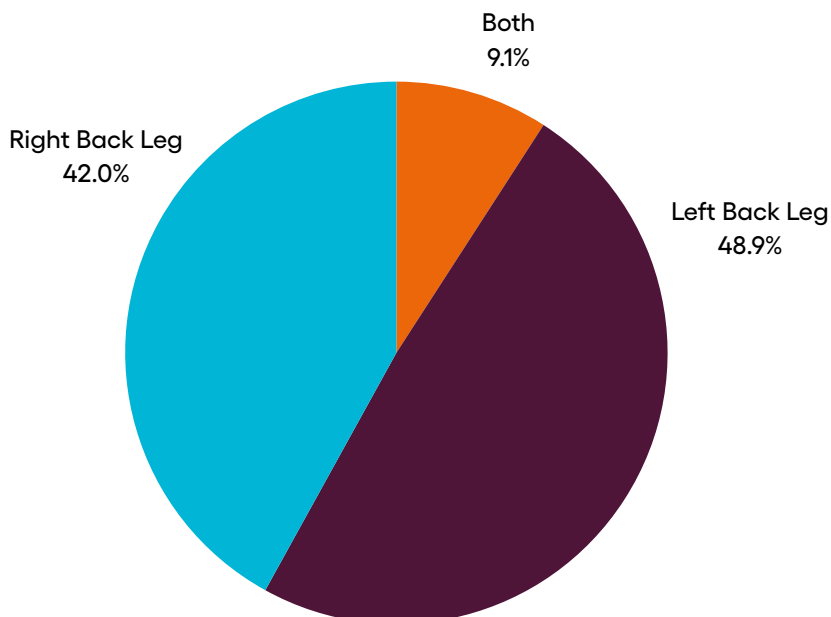


Figure 4

4. CLINICAL ASSESSMENT

4.1 Lameness

Lameness at the time of presentation was assessed by the veterinary surgeon using a 6 point scale ⁴. Lameness was graded in the affected limb in 48.9% of pathways (n=486) and in the unaffected limb in 41.7% of pathways (n=414). The median lameness grade in the affected limb was 3/5 (**Table 3** and **Figure 5**).

4.2 Duration of Lameness

Duration of lameness was recorded by the owner (**Figure 6**).

Table 3 - Lameness Grade

Lameness Grade	Affected Limb (n)	Unaffected Limb (n)
0	7	377
1	24	24
2	127	7
3	203	1
4	99	3
5	26	2

4.3 Clinical Signs

Lameness was reported in 50.9% (n=506) of patient pathways, with reluctance to exercise reported in 22.9% (n=228) and stiffness after exercise reported in 18.9% (n=188). When recorded, 21.4% of patient pathways had previously had cruciate surgery on the contralateral limb (n=203) and another medical issue was reported in 22.8% (n=205).

4.4 Clinical Examination Findings

The most commonly reported clinical findings were pain in the stifle 77.5% (n=770) and a stifle effusion 70.8% (n= 704).

Lameness Grade

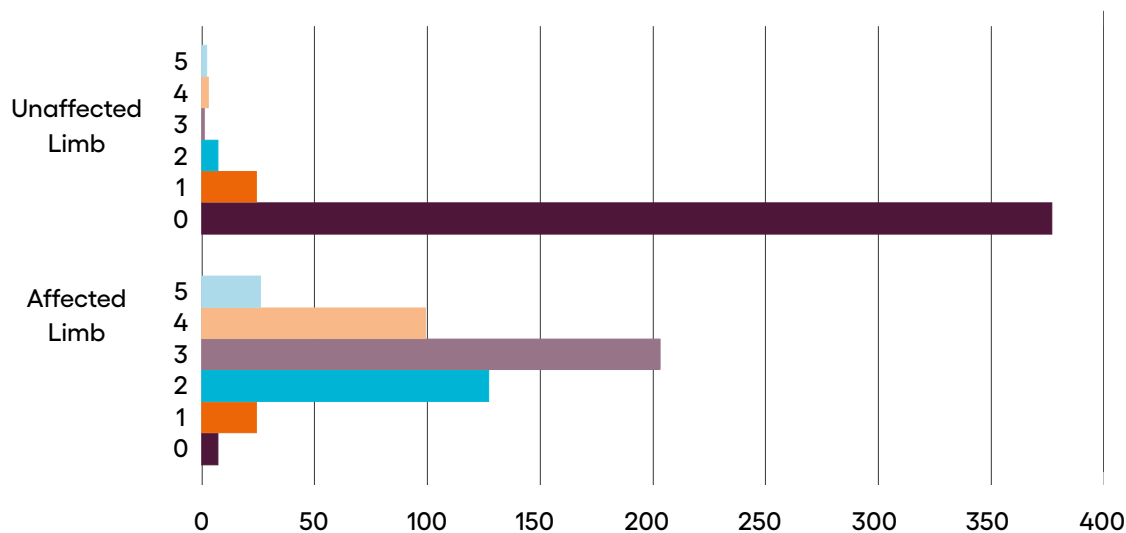


Figure 5

Lameness was reported in 50.9% of cases



Duration of Lameness

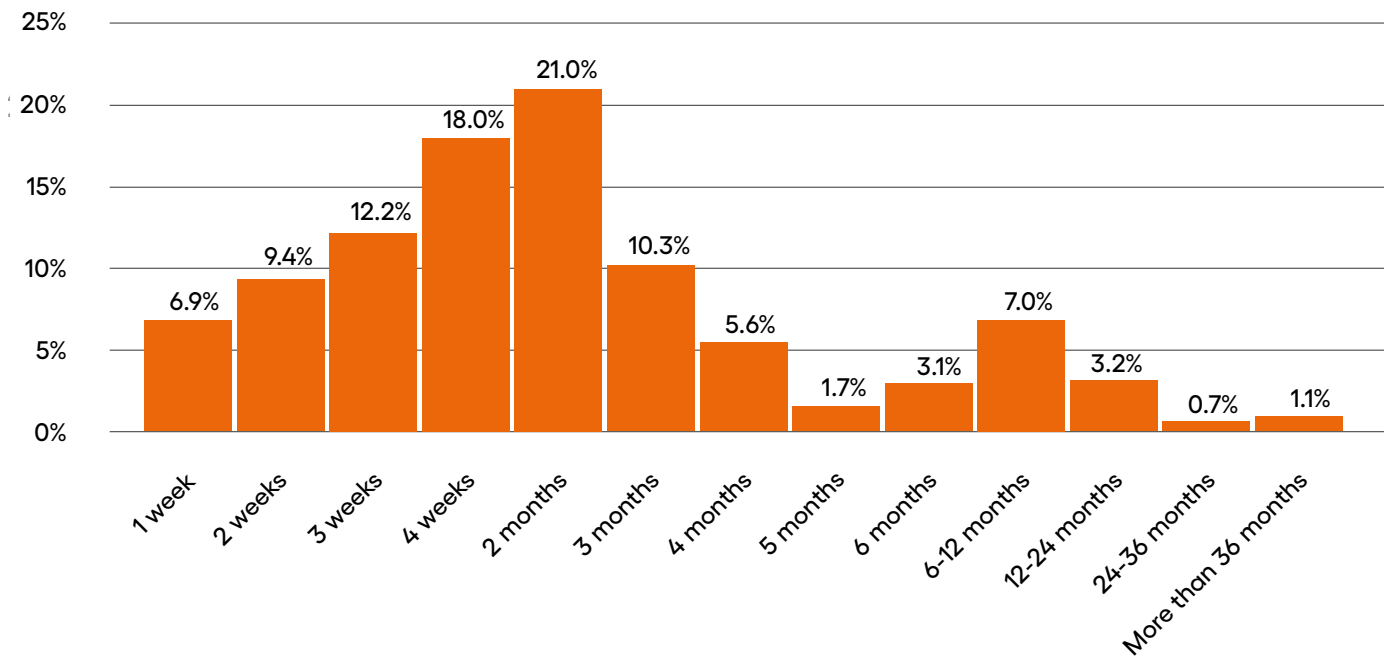


Figure 6

5. SURGERY PROCEDURES

5.1 Procedures

735 surgical procedures were recorded. This represents 73.9% of patient pathways. The majority of procedures were osteotomies (**Table 4** and **Figure 7**). 1.3% (n=13) pathways had previously had surgery on the contralateral limb which were recorded in the CCR.

Table 4 - Surgical Procedures

	Number (n)	%
CBLO	3	0.4%
CCWO	208	28.3%
Extracapsular	29	3.9%
TPLO	435	59.2%
TTA/MMP	60	8.2%
Total	735	

5.2 Intra-articular Assessment

An intra-articular assessment was performed in 92.0% of procedures (n=676). This was performed via an arthrotomy in 98.0% of patients (n=662) and arthroscopically in the remainder.

5.3 Cruciate Tear

The degree of cranial cruciate ligament tear was recorded in 96.3% of these (n=651) with 78.3% being complete tears and 21.7% partial tears.

5.4 Medial Meniscal Assessment

The state of the medial meniscus was recorded in 97.9% of these pathways (n=662). A medial meniscal tear was identified in 36.2% of these patients. The tear was classified in 33.8% (n=224) of these cases with a bucket handle tear being most common (**Table 5** and **Figure 8**). A meniscal tear was recorded in 42.4% (n=216) of patients with a complete tear of the cranial cruciate ligament vs 17.0% of patients with a partial tear.

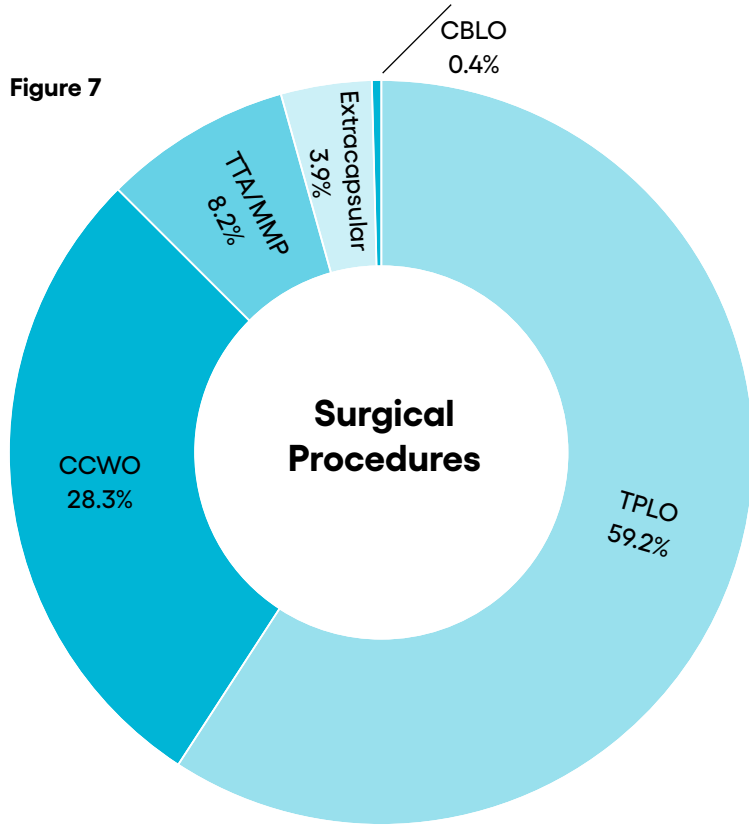
Table 5 - Meniscal Tear Type

	(n)	%
Bucket Handle Tear	172	76.8%
Complex Tear	9	4.0%
Degenerative Tear	5	2.2%
Flap Tear	21	9.4%
Radial Tear	8	3.6%
Vertical Longitudinal Tear	9	4.0%
Total	224	

5.4.1 Meniscal Treatment

A partial meniscectomy was performed in 89.0% of pathways where a medial meniscal tear was reported (n= 218). A meniscal release was reported in 1.6% of patients (n=4). Data in the remainder was not reported or not classified consistently. A meniscal procedure was reported in 1.7% (n=7) of medial menisci that were classified as normal, including meniscal release in 3.

Figure 7



735
surgical
procedures
performed

Most common
reported meniscal
tear: Bucket
Handle Tear

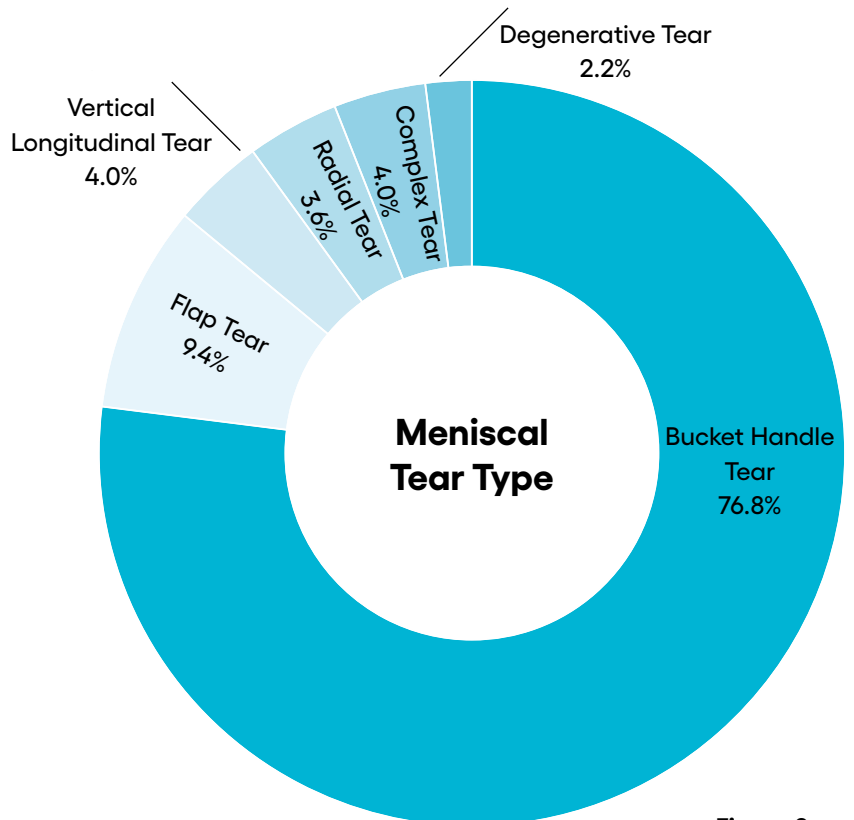


Figure 8

5.5 Additional Procedures

Additional procedures were performed in 6.3% (n=46) of procedures. Two additional procedures were reported; correction of a medial patellar luxation and placement of an anti-rotational suture. Both were performed in one patient. Placement of an anti-rotational suture was predominantly reported following TPLO (4.1% of TPLOs n=18) (**Table 6**).

Table 6 - Additional Procedures


Procedure	CCWO (n)	TPLO (n)	TTA (n)	Extracapsular (n)	Total
Medial Patellar Luxation Correction	3	11	6	7	27
Anti-Rotational Suture	0	18	0	0	18
Medial Patellar Luxation Correction and Anti-Rotational Suture	1	0	0	0	1
					46

5.6 Regional Anaesthesia

Regional anaesthesia was used in 83.1% of patients (n=611). Most commonly this was a femoral and sciatic block. Regional anaesthesia classified as 'Other' mainly consisted of local splash blocks and occasional intra-articular administration of local anaesthetic (**Table 7**).

Table 7 - Regional Anaesthesia

Regional Anaesthesia Technique	(n)	%
Epidural	173	28.3%
Femoral and Sciatic	282	46.2%
Femoral	3	0.5%
Lumbar Plexus	13	2.1%
Other	140	22.9%
Total	611	



Regional anaesthesia was used in 83.1% of patients

5.7 Surgery and Anaesthesia Time

Total surgical time and anaesthesia time were recorded in 69.4% (n=510) and 62.9% (n=462) of procedures respectively. Mean surgical time was 77.2±30.7mins (median 72 mins) with a range of 15-270 mins. Mean anaesthesia time was 145.2±39.4mins (median 145 mins) with a range of 20-240 mins. There was some variation between procedures (**Table 8**).

5.8 Antibiotic Usage

Peri-operative antibiotics were used in 99.9% of surgical procedures (n=734). Post-operative antibiotics were used following 37.1% (n=273). The mean duration of the post operative course was 5.7 days (median 5 days range 1-14 days).

Table 8 - Surgery and Anaesthesia Time


Procedure	Surgical Time				Anaesthesia Time			
	(n)*	Mean Time ± SD (mins)	Median (mins)	Range (mins)	(n)*	Mean Time ± SD (mins)	Median (mins)	Range (mins)
CCWO	145	97.2±31.5	120	20-270	126	159.6±39.1	160	40-240
Extracapsular	23	58.0±24.8	45	30-120	22	116.4±33.7	120	65-180
TPLO	295	71.3±26.1	65	30-180	263	141.9±34.9	135	60-240
TTA/MMP	47	62.1±27.5	55	15-150	51	137.4±51.7	130	40-240
Combined	510	77.2±30.7	72	15-270	462	145.2±39.4	145	40-240

* of procedures when recorded.



6. OUTCOMES

Primarily, outcomes are assessed using Client Reported Outcome Measures (CROMs). Owners are asked to complete both a baseline Liverpool Osteoarthritis in Dogs (LOAD) and a Canine Orthopedic Index (COI). Follow up questionnaires are sent after the procedure at 6 weeks, 12 weeks, 6 months, 1 year and then at yearly intervals. Both LOAD and COI scores are calculated on a numeric basis with a lower score being representative of better mobility. The maximum LOAD and COI scores are 52 and 64 respectively. In both CROMs a clinical improvement is represented by a lower score when compared to the previous assessment point. The numbers of outcome measures completed at each time point is shown in **Table 9**.



Client Reported Outcome Measures were used to assess outcomes

6.1 Procedure

Outcomes assessed by LOAD and COI are displayed in **Figure 9** and **Figure 10** respectively. There was an improvement in outcome scores following surgery with all procedures, though variation in the amount and rate of improvement.

Table 9 - Completed Outcome Measures

Procedure	Baseline (n)		6 weeks (n)		3 months (n)		6 months (n)		1 year (n)	
	LOAD	COI	LOAD	COI	LOAD	COI	LOAD	COI	LOAD	COI
CBLO	1	1	0	0	0	0	0	0	0	0
CCWO	189	187	96	92	82	83	68	68	34	34
Extracapsular	25	25	7	6	8	8	11	11	0	0
TPLO	399	393	235	227	201	198	152	149	86	85
TTA/MMP	57	57	38	38	33	33	25	25	13	13
Total	671	663	376	363	324	322	256	253	133	132

Mean LOAD Score by Procedure

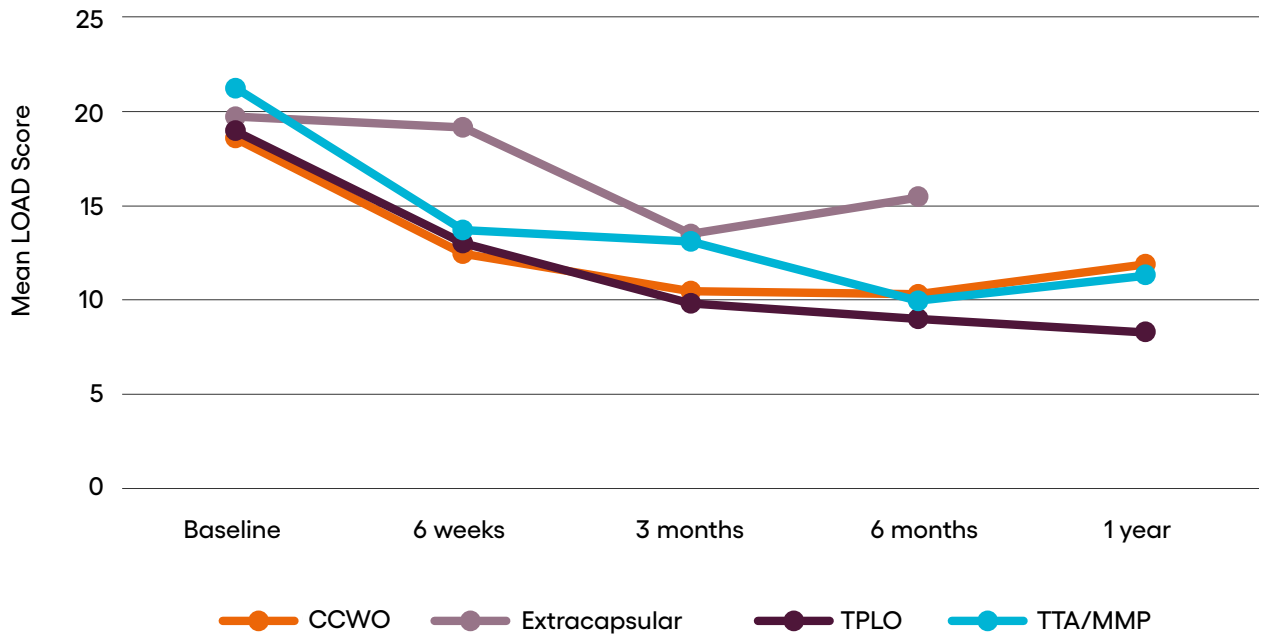


Figure 9

Mean COI Score by Procedure

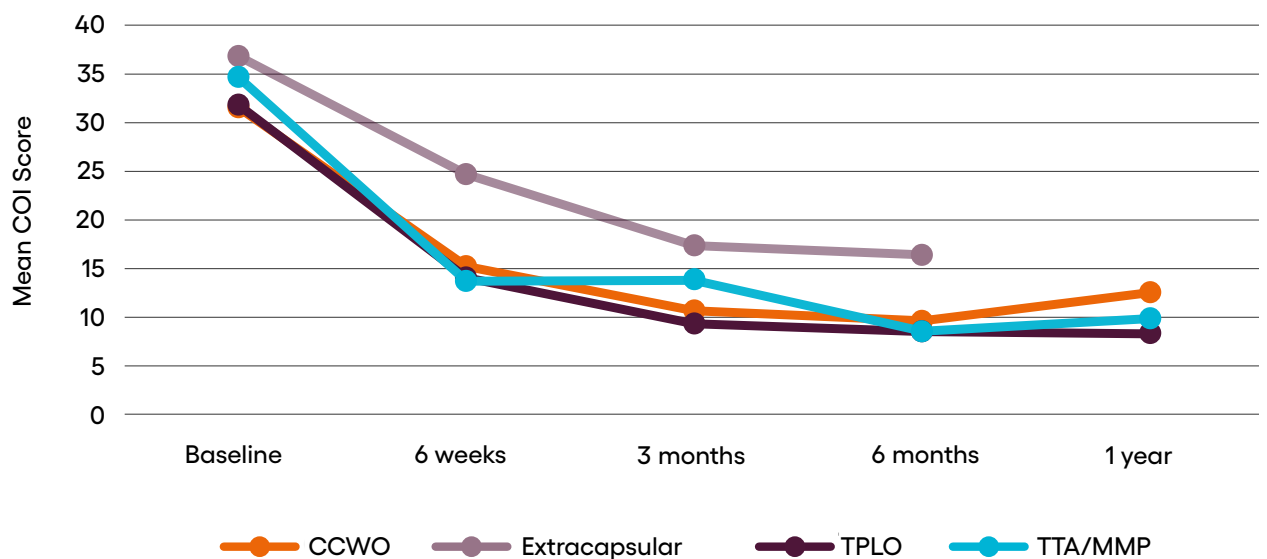


Figure 10

6.2 Partial vs Complete Tear

The affect on outcomes of a complete tear of the cranial cruciate ligament vs a partial tear is displayed in **Figure 11** (LOAD) and **Figure 12** (COI). The degree of partial tear was not evaluated.

Mean LOAD Score vs Cruciate Tear

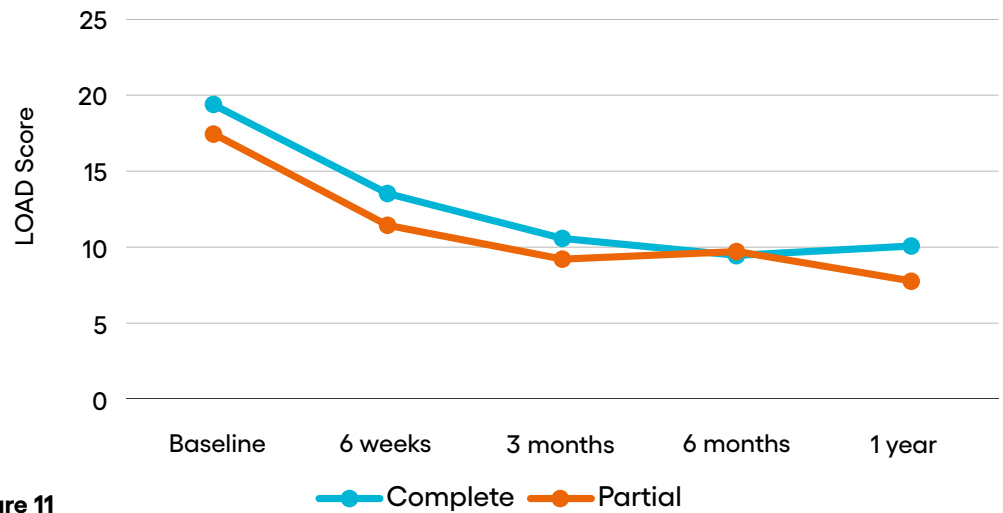


Figure 11

Mean COI Score vs Cruciate Tear

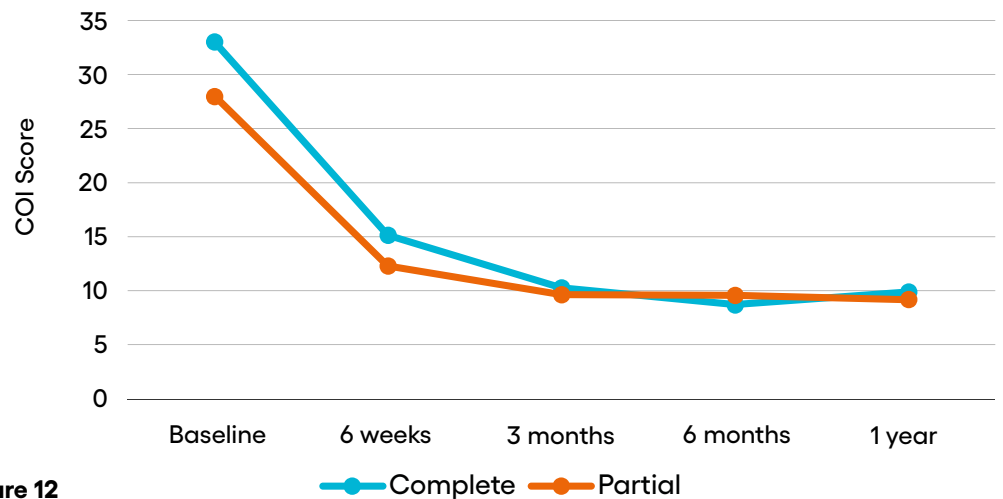


Figure 12

6.3 Meniscal Tear

Outcomes with a medial meniscal tear are compared by LOAD (Figure 13) and COI (Figure 14).

Mean LOAD Score vs Meniscal Tear

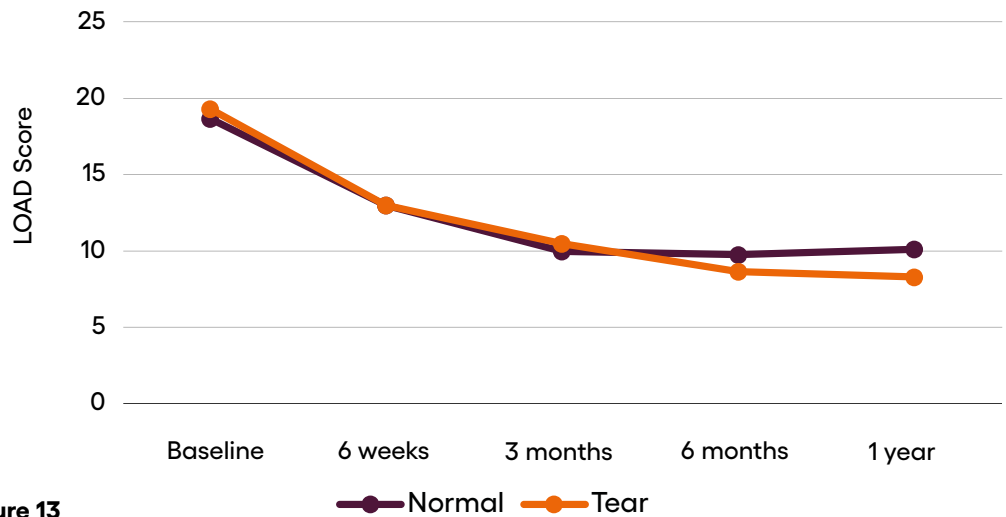


Figure 13

Mean COI Score vs Meniscal Tear

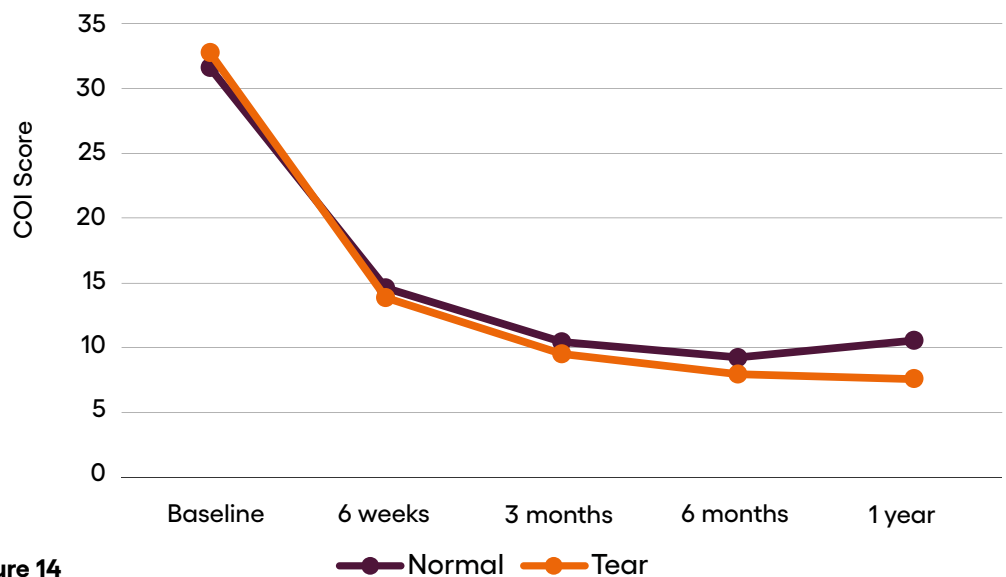


Figure 14

6.4 Owner Assessment of Function

Owners are asked to rate their dogs function as compared to before surgery. The majority of patients are rated as 'Much Better' at all time intervals. There is some variation between procedures at each time point (**Table 10** and **Figure 15**).

**Majority of owners
rated their pet's
function as Much
Better than before
surgery**

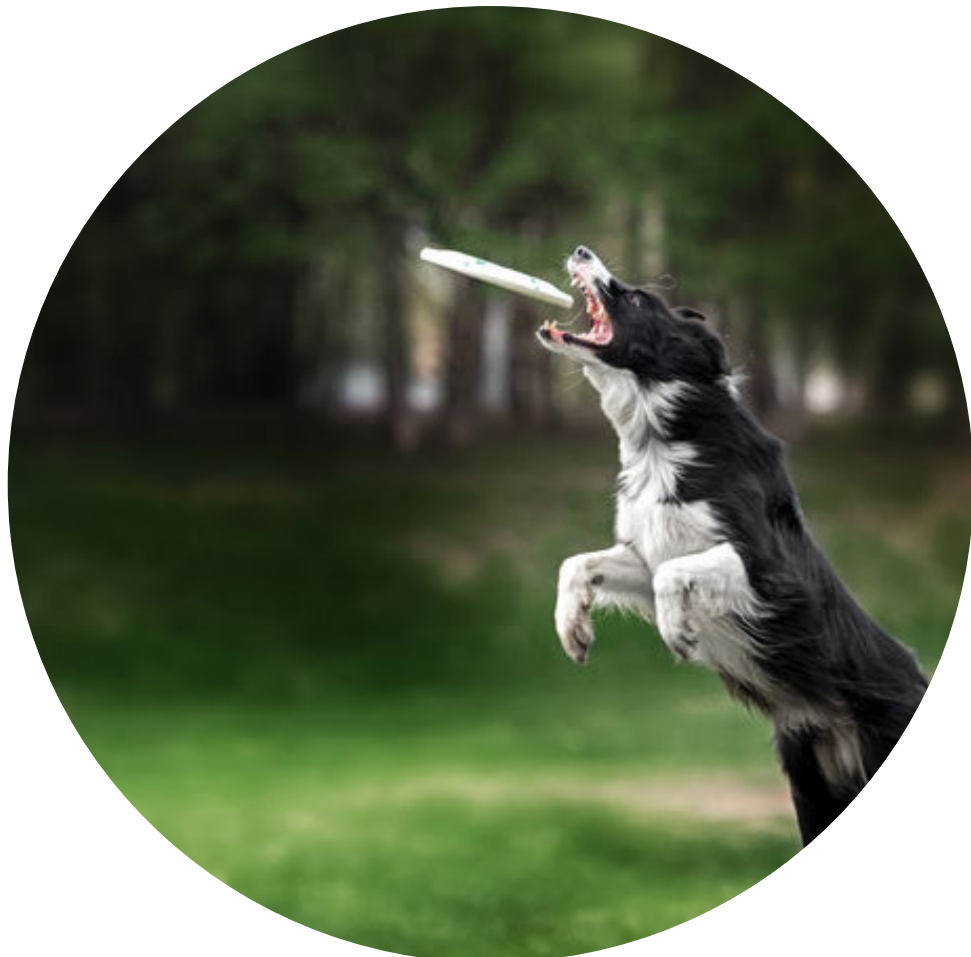
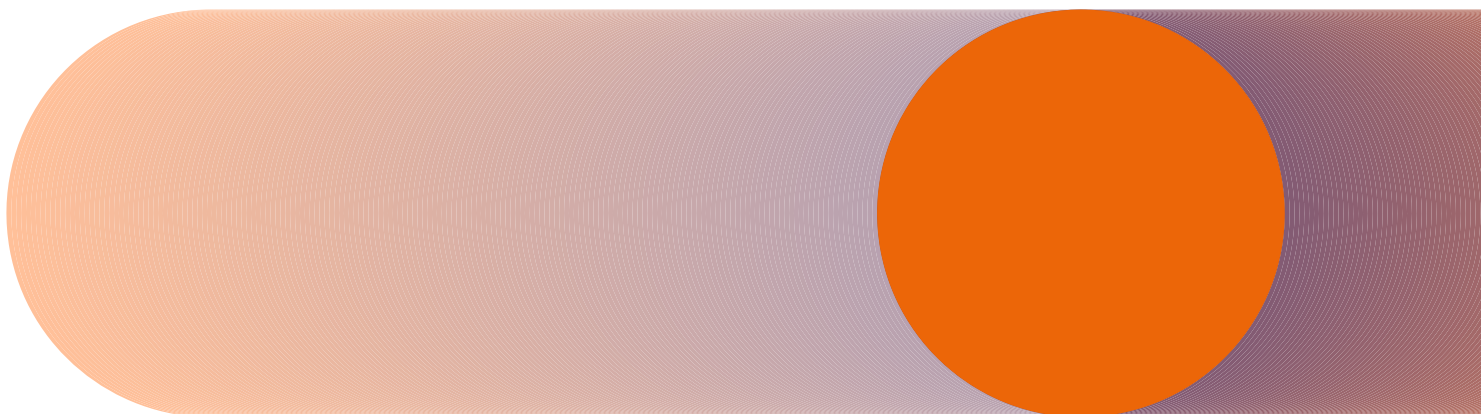


Table 10 - Owner's Rating of Leg Function Post-Op

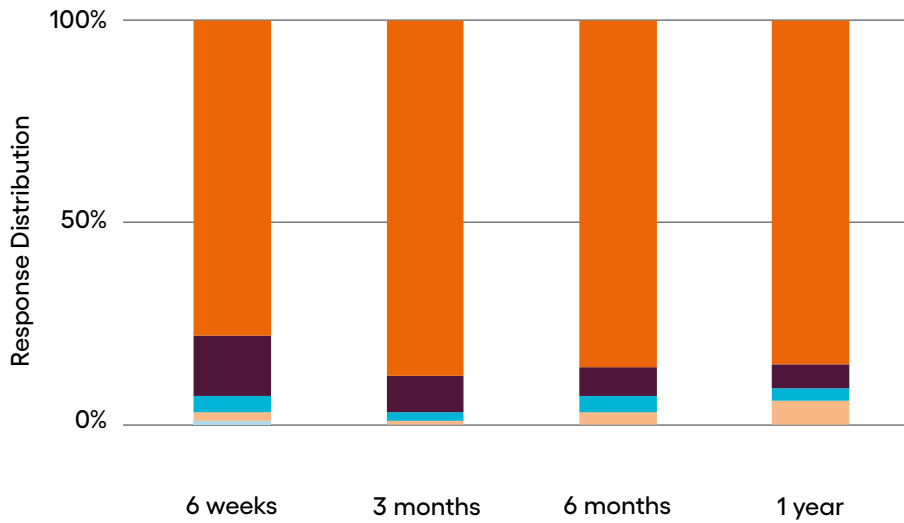
Procedures	Much worse	Somewhat worse	About the same	Somewhat better	Much better
CCWO					
6 week	1%	2%	4%	15%	78%
3 month		1%	2%	9%	88%
6 month		3%	4%	7%	85%
1 year		6%	3%	6%	85%
Extracapsular					
6 week					100%
3 month				13%	88%
6 month			9%	36%	55%
1 year					
TPLO					
6 week	1%	2%	6%	20%	70%
3 month		1%	4%	10%	85%
6 month	1%	2%	1%	7%	88%
1 year		1%	4%	6%	89%
TTA/MMP					
6 week			8%	3%	89%
3 month		6%	9%	9%	75%
6 month			4%	8%	88%
1 year				31%	69%



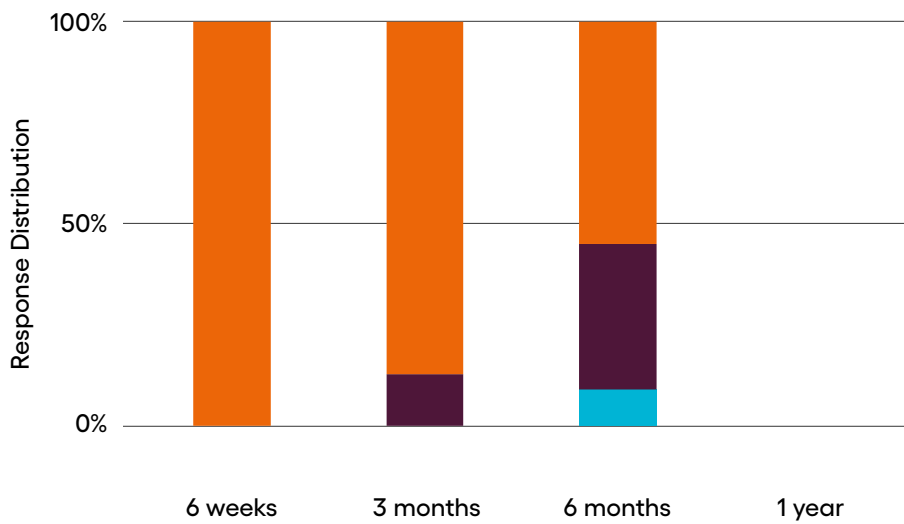
Owner's Rating of Leg Function Post-Op

● Much worse ● Somewhat worse ● About the same ● Somewhat better ● Much better

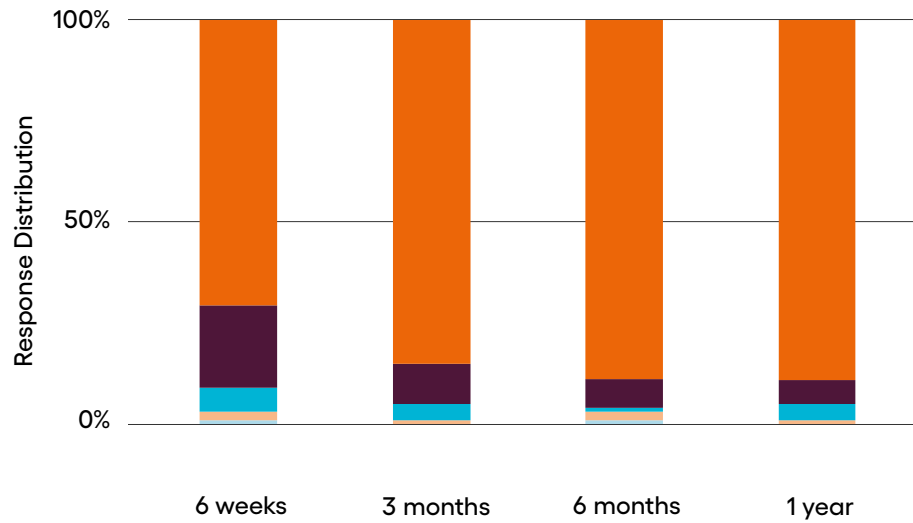
CCWO



Extracapsular



TPLO



TTA/MMP

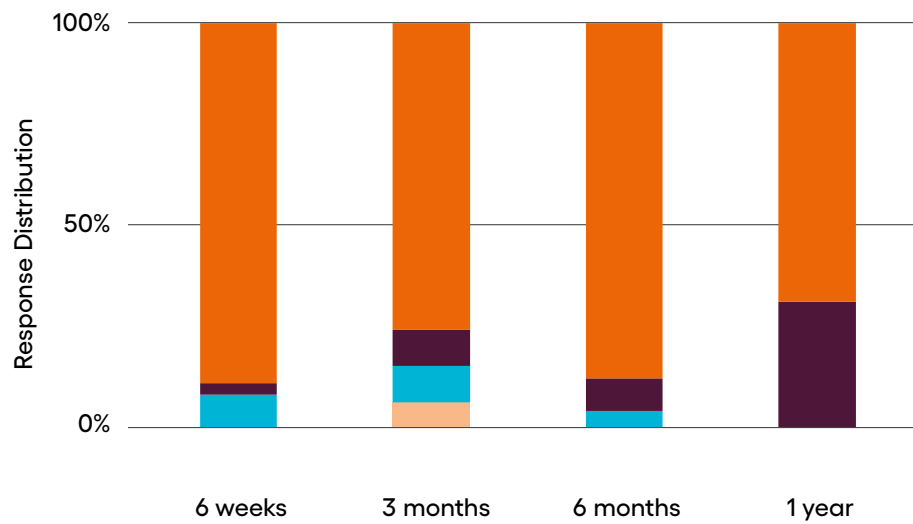


Figure 15

7. ADVERSE EVENTS

7.1 Adverse Events

Intra-operative adverse events were reported in 6.3% of surgical procedures (n=46). The most common adverse event was significant haemorrhage (n=7) (**Table 11**). The other adverse events reported included a range of issues relating to equipment, implants, regurgitation and anaesthesia related issues.

Table 11 - Adverse Events

Adverse Event	Number (n)
Significant Haemorrhage	7
Hinge Break	3
Screw in Joint	2
Distal Cortex Fracture	1
Fibular Fracture	1
Break in Aseptic Technique	1
Hinge Break	1
Mal-Alignment	1
Screw Placed in Osteotomy	1
Wire Cut Through Bone	1
Not Recorded	5
Other	22
Total	46

Haemorrhage
was the most
commonly
reported
adverse event

8. COMPLICATIONS

Owners are asked to report complications each time they complete a follow up questionnaire. Veterinary surgeons can report complications as they occur or at the time of a follow up assessment. This methodology is designed to maximise the reporting accuracy and improve data quality.

8.1 Complication Rates

The overall vet reported complication rate was 13.9% (n=102). The overall owner reported complication rate was 13.0% (n=95). The variation by procedure is displayed in **Table 12** and **Figure 16**. A complication represents a pathway where one or more complications were reported. The veterinary reported complications, frequency of occurrence

and timeframe are listed in **Appendix 1**. The veterinary reported complications, frequency of occurrence and timeframe are listed in **Appendix 1**. The owner reported complications, frequency of occurrence and timeframe are listed in **Appendix 2**. Methods to allow more in-depth analysis of complications will be reviewed for future reports (including more detailed classification of minor/major complications and the management required).

* No complications were reported for any Extracapsular procedures.

** No follow-up was reported for any CBLO procedures, so these were excluded.

Table 12 - Complication Rates by Procedure

	(n)	Complications	
		Vet Reported	Owner Reported
TPLO	435	15.9%	14.7%
CCWO	208	10.6%	9.1%
TTA/MMP	60	18.3%	20.0%
Extracapsular	29	0%	0%

Overall vet reported complication rate was 13.9%

Complication Rates by Procedure

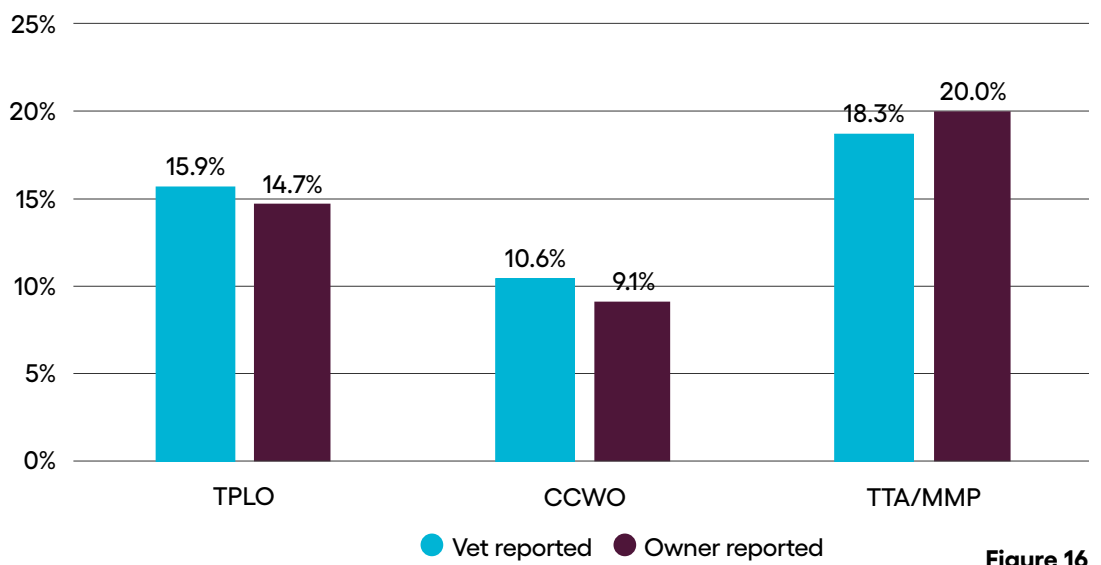


Figure 16

9. FUTURE FOCUS AND DEVELOPMENT

The CCR will continue to develop in the next 12 months. New functionality to allow alerting of complication reports and registration of new patients will be launched. Owners will be able to receive requests to complete questionnaires via SMS as well as email if they provide consent at registration.

We hope that the quality of the data can be improved. Some additional fields will be made mandatory, and some questions and options will be amended to allow more consistent reporting, particularly around complications.

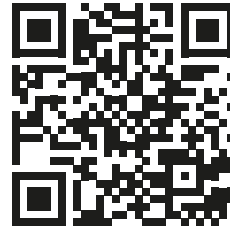
RCVS Knowledge will continue to explore engagement with interested parties to enable international expansion.



10. INFORMATION FOR USERS

Are you a dog owner?

Discover how the CCR could benefit dogs in the UK.



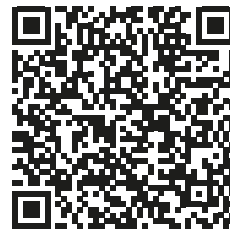
Do you work in veterinary practice?

Find out how you can use the CCR to improve outcomes.



Are you ready to start contributing to the CCR?

Sign up to take part.



Do you want to know more about cruciate ruptures?

Learn about the most common surgical procedures.



APPENDIX 1

VET REPORTED COMPLICATIONS

Table 13 - Vet Reported Complications

Complication	Procedure	0-3 months (n)	3-6 months (n)	6-9 months (n)	1 year (n)
Delayed Union	CCWO	1	0	0	0
	TPLO	0	1	0	0
	TTA/MMP	0	0	0	0
Draining Tract	CCWO	1	0	0	0
	TPLO	2	2	0	0
	TTA/MMP	2	0	0	0
Fibular Fracture	CCWO	1	1	0	0
	TPLO	3	1	0	0
	TTA/MMP	0	0	0	0
Implant Failure	CCWO	2	0	1	0
	TPLO	0	0	0	0
	TTA/MMP	0	0	0	0
Incisional Oedema / Haematoma / Bruising	CCWO	0	0	0	0
	TPLO	1	0	0	0
	TTA/MMP	0	0	0	0
Infection	CCWO	3	1	0	0
	TPLO	20	9	1	0
	TTA/MMP	2	1	1	0
Kirschener Wire Loosening	CCWO	1	0	0	0
	TPLO	0	0	0	0
	TTA/MMP	0	0	0	0
Medial Patellar Luxation	CCWO	0	0	0	0
	TPLO	2	3	1	0
	TTA/MMP	0	0	0	0
Meniscal Tear	CCWO	0	2	2	0
	TPLO	0	1	2	2
	TTA/MMP	1	0	0	0
Patellar Tendonitis	CCWO	0	0	0	0
	TPLO	2	2	0	0
	TTA/MMP	0	0	0	0
Residual Joint Laxity	CCWO	0	0	0	0
	TPLO	3	0	0	0
	TTA/MMP	0	0	0	0

Complication	Procedure	0-3 months (n)	3-6 months (n)	6-9 months (n)	1 year (n)
Rotational Instability (Pivot Shift)	CCWO	3	0	0	0
	TPLO	3	1	0	0
	TTA/MMP	0	0	0	0
Screw Loosening	CCWO	0	0	0	0
	TPLO	2	0	1	0
	TTA/MMP	0	0	0	0
Seroma / Swelling Fracture	CCWO	2	2	0	0
	TPLO	7	1	1	0
	TTA/MMP	0	0	0	0
Tibial Fracture	CCWO	0	0	0	0
	TPLO	0	0	0	0
	TTA/MMP	1	0	0	0
Tibial Tuberosity Fracture	CCWO	1	1	0	0
	TPLO	0	1	0	0
	TTA/MMP	3	0	0	0
Traumatic Wound Dehiscence	CCWO	2	0	0	0
	TPLO	4	0	1	0
	TTA/MMP	1	0	0	0
Other	CCWO	3	2	1	0
	TPLO	13	5	1	0
	TTA/MMP	4	0	0	0
	TOTAL CCWO	22	9	4	0
	TOTAL TPLO	66	27	9	2
	TOTAL TTA/MMP	15	1	1	0

* The following complications are selectable options but were not reported; Anchor Failure, Bandage Complications, Bone Tunnel Widening, Extracapsular Suture Failure, Iatrogenic Tibial Deformity, Lateral Patellar Luxation, Osteomyelitis, Patella Alta, Patella Baja, Patellar Fracture, Peroneal Nerve Injury, Ring Sequestrum, Tibial Deformity.

APPENDIX 2

OWNER REPORTED COMPLICATIONS

Table 13 - Owner Reported Complications

Complication	Procedure	0-3 months (n)	3-6 months (n)	6-9 months (n)	1 year (n)
Clicking, Grinding Sounds	CCWO	1	0	1	0
	TPLO	3	2	2	0
	TTA	1	1	0	0
Inability to Walk	CCWO	0	0	0	1
	TPLO	5	6	4	0
	TTA	1	1	0	1
Infection - Deep	CCWO	1	0	1	1
	TPLO	5	3	4	0
	TTA	2	2	1	0
Infection - Skin Only	CCWO	3	2	0	0
	TPLO	6	2	1	0
	TTA	0	2	0	0
Joint / Leg Swelling	CCWO	2	3	0	2
	TPLO	10	6	3	1
	TTA	1	1	0	0
On-Going Pain	CCWO	1	0	0	2
	TPLO	6	4	3	1
	TTA	1	1	0	0
Wound Problems	CCWO	0	0	0	0
	TPLO	11	3	0	0
	TTA	2	2	0	0
Other	CCWO	5	4	6	2
	TPLO	11	8	1	2
	TTA	1	2	0	1
	TOTAL CCWO	13	9	8	8
	TOTAL TPLO	57	34	18	4
	TOTAL TTA/MMP	9	12	1	2

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³ Laflamme, D.P. (1997) Development and validation of a Body Condition Score System for dogs. *Canine Practice*, 22 (1), pp. 10-15.

⁴ Impellizeri, J.A., Tetrick, M.A. and Muir, P. (2000) Effect of weight reduction on clinical signs of lameness in dogs with hip osteoarthritis. *Journal of the American Veterinary Medical Association*, 216 (7), pp. 1089-1091. <https://doi.org/10.2460/javma.2000.216.1089>

ACKNOWLEDGEMENTS

RCVS Knowledge would like to say thank you to all the veterinary professionals and owners who have contributed data to the Canine Cruciate Registry.

With your continued help we hope to improve the outcomes for dogs with cranial cruciate ligament ruptures.

If you have signed up, but haven't enrolled any patients yet, please get involved, your data will make a difference, not only to your own patients but to all dogs undergoing cruciate surgery in the future.

Help us, help you, help your patients:
caninecruciateregistry.org.

RCVS Knowledge Canine Cruciate Registry use two validated Client-Reported Outcome Measures (CROMs), that have been specifically developed to assess outcomes in canine orthopaedics. These are the 'Liverpool Osteoarthritis in Dogs' instrument, developed at the University of Liverpool, and the Canine Orthopedic Index, developed by the American College of Veterinary Surgeons.

We are grateful to Elanco, the University of Liverpool, and the American College of Veterinary Surgeons for allowing us to use these questionnaires in this project. The RCVS Knowledge Canine Cruciate Registry is endorsed by the British Veterinary Orthopaedic Association.

The RCVS Knowledge Canine Cruciate Registry is managed on a day-to-day basis by Amplitude Clinical Outcomes, a global leader in online registry software.



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