RCVS KNOWLEDGE

RCVS KNOWLEDGE CANINE CRUCIATE REGISTRY REPORT 2025

RCVS Knowledge is a charity with a mission to advance the quality of veterinary care for the benefit of animals, the public and society.

We empower and support veterinary teams to provide evidence-based, quality care and improved animal health and welfare outcomes.

Veterinary teams face many challenges in accessing up-to-date knowledge and applying it in practice. To support them and deliver our mission we:

- create and share practical support and tools to help veterinary teams and other animal health professionals deliver better animal health and welfare outcomes in a structured and sustained way
- provide veterinary science and animal health resources to help busy veterinary professionals stay up to date with the most relevant research and apply it in practice
- curate and raise awareness of veterinary history to ensure that veterinary care today and in the future is built on knowledge and understanding of the past.

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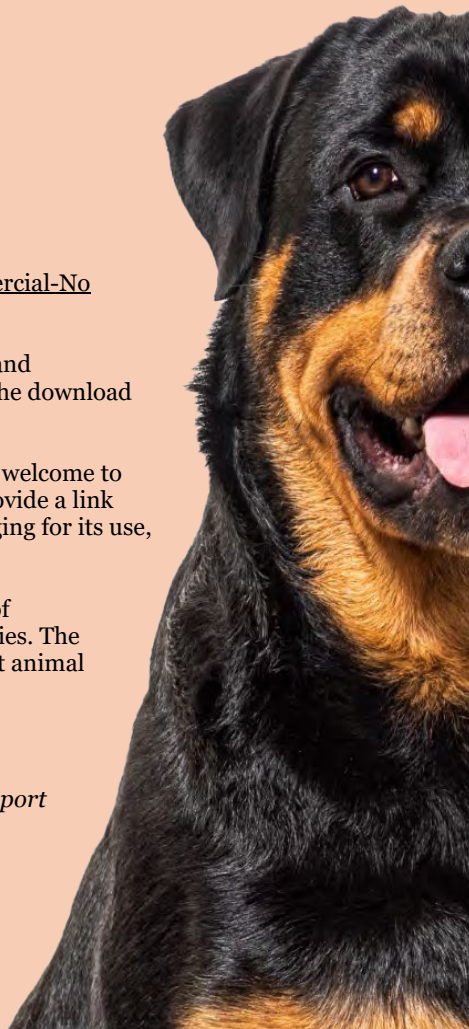

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RCVS KNOWLEDGE
CANINE CRUCIATE REGISTRY
REPORT 2025

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A MESSAGE FROM THE CHAIR OF OUR BOARD OF TRUSTEES

I'm delighted to share that this report marks another impressive year in the evolution of the RCVS Knowledge Canine Cruciate Registry (CCR). The number of surgical procedures logged rose by 40% in the past 12 months to nearly 2,000 in total, and we now have almost 600 registered users.

This fantastic result is due to the enthusiasm and commitment of all the veterinary team members and pet owners who have taken the time to join us on this journey. The richness and value of the CCR is a direct result of your contributions, so I want to say a sincere thank you to each and every one of you.

Last year the CCR excited huge interest across the professions. Now in its fourth year, it has started to generate real impact. The primary aim of the CCR was to gather data on cruciate surgeries to provide veterinary professionals with the evidence required to make informed care decisions in collaboration with clients. Ever-increasing numbers of registered users and logged cases are enabling the CCR to do just that. But this year, we have also heard from vet teams about a wide range of further benefits the CCR is bringing.

Vets have told us that CCR data has increased their confidence in their treatment approaches. Others have been inspired to make changes, notably including reducing antibiotic prescribing. Improved antimicrobial stewardship is a brilliant additional outcome for these practices and the CCR.

We've also heard that the CCR has enriched client consults: it provides confidence when discussing options with owners, who are better informed earlier on in the decision-making process and consistently leap at the chance to help make care better in the future. What's more, logging cases in the CCR has brought care issues to light, revolutionised data collection and storage processes, simplified and streamlined auditing and benchmarking, and made it much easier to generate reports for team discussions and external requirements.

I find it so rewarding and motivating to hear about all these wide-ranging and beneficial impacts of the CCR – and I hope you feel the same way. To all of you who already take part, please keep logging those cases and encourage your colleagues to do so. And please do remember to mention the CCR to every relevant client – their permission is of course vital and we hear that pet owners are overwhelmingly keen to help.

If you work in a veterinary team and have a role other than vet – why not show your colleagues the evidence in this report and the benefits of participating, and ask for permission to log cases on their behalf? To the pet owners taking the time to read this report – thank you for your interest. I hope you can see that being part of the CCR can help you to be actively involved in decisions about your dog's care – and improve canine cruciate management for all dogs.

We now know for certain that the CCR is having a genuine, positive impact on canine cruciate management, as well as other aspects of practice. Let's continue to work together to build the breadth and power of this remarkable resource.

Amanda Boag
Chair, Board of Trustees

A MESSAGE FROM OUR CLINICAL LEAD

I am pleased to introduce this year's report from the RCVS Knowledge Canine Cruciate Registry (CCR). The CCR continues to develop into a valuable national resource, capturing real-world data on cruciate surgery and postoperative recovery. As more practices participate and more cases are followed over longer periods, the dataset becomes increasingly robust and useful, both for the profession and for individual clinical audit.

The ongoing growth of the CCR remains important. To draw reliable conclusions, we need data from across the profession, incorporating all surgical techniques and a wide range of case types. The CCR also offers a straightforward way for clinicians to review their own outcomes. Having clear, practice-specific information allows us to have more open and informed discussions with owners about expected recovery, likely function, and possible complications.

Although clinical audit can be approached in many ways, the CCR makes it easy to integrate into day-to-day practice and involves owners directly in reporting outcomes. This year has seen the launch of a new complications dashboard for clinicians, allowing benchmarking against the rest of the registry dataset. I'd encourage you to use this and find where and how you can improve.

This year has also seen wider developments in the regulatory landscape. The Competition and Markets Authority released its Provisional Decision Report (PDR)[1] which, among many other points, highlights the need for greater transparency with pet owners. The CCR can play an important role in supporting this, by helping us understand and communicate our own outcomes and complication rates in an open and meaningful way.

The recent report on contextualised care from RCVS Knowledge[2] emphasises the importance of shared decision-making and ensuring that treatment discussions are grounded in clear, relevant information. To do this well, we need reliable outcomes data that reflects what actually happens in practice. The CCR provides exactly that, and continued participation will help strengthen the evidence base needed for these conversations.

As in previous years, it is not possible within this report to explore the dataset in full detail. However, registries are particularly useful for identifying patterns and raising questions that merit further investigation. Over the coming months we will define a number of research questions that can be addressed using CCR data, and we will invite colleagues to work with us on these. Expanding the research activity around the Registry remains an important goal.

To everyone already submitting cases, thank you. This project depends on your ongoing involvement, and we are very grateful for your support. Please continue to encourage colleagues to join. Even for those not performing cruciate surgery, the insights generated by the Registry can help inform clinical decision-making for their patients.

I would also like to thank Rhiannon Hornett and the team at Amplitude Clinical Outcomes for their continuing support with data management, analysis, and interpretation. Their input remains central to the development of the Registry. My thanks also go to the wider team at RCVS Knowledge, whose commitment continues to drive the project forward.

Finally, I am grateful to all the dog owners who contribute to the Registry. By sharing information about their dog's recovery, they are helping to improve outcomes for patients undergoing cruciate surgery now and in the future.

Mark Morton
Clinical Lead

STEERING GROUP MEMBERS

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

It comprises two specialists in small animal orthopaedics, two experienced GP vets, an epidemiologist, a lay member, representation from the RCVS Knowledge Quality Improvement Advisory Board and members of the British Veterinary Orthopaedic Association (BVOA), which endorses the project.

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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 to 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)[3] questionnaire and the Canine Orthopaedic Index (COI)[4].

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 annual reports. Data collected up to the end of July 2025 is included in this report.

REPORT SUMMARY

- There were **593** registered users.
- **1,849** surgical procedures have been logged since the launch of the registry.
- The majority of procedures performed were osteotomies. The proportion of Tibial Plateau Levelling Osteotomy (TPLO) performed increased and the proportion of Cranial Closing Wedge Osteotomy (CCWO) decreased since the 2024 report.
- The use of regional anaesthesia remained constant, being used in **84.3%** of patients. A femoral and sciatic block combined was the most commonly used regional anaesthetic approach.
- Patient ages were recorded in almost all procedures and ranged from 3 months to 18 years.
- Patient weights were recorded in over 70% of patients, ranging from 1.6kg to 80.3kg.
- The degree of cranial cruciate ligament tear was recorded in the majority of patients. Over two-thirds were complete tears.
- Intra-articular assessment was performed in **97.2%** of procedures, most commonly via arthrotomy.
- Peri-operative antibiotics continued to be used in 99.9% of surgical procedures. However, post-operative antibiotic use has decreased by **19.3%** since 2021.
- The most common breeds were Labrador retriever, Cockapoo, English springer spaniel, Staffordshire bull terrier and Golden retriever.

142 different dog breeds (or recognised variations) were reported

1.USER PROFILES

1.1 Users

There were 593 registered users of the CCR, including veterinary surgeons and delegates, with 173 pathway owners (i.e. have contributed cases).

1.2 Professional designation

56.8% of pathways were registered to Advanced Practitioners (n=1,425). 14.9% were registered to RCVS Recognised Specialists (n=374). Pathways with procedures were distributed in a similar way. There was no significant change in this distribution compared to 2024.

1.3 Experience

Using years since graduation as a measure of experience, the mean experience of pathway owners was 20.6 years (median 20 years) with a range of 1–41. Mean years were calculated using the 'Activity Date' (either the date of the procedure or the date of pathway registration).

2. PATIENT NUMBERS

Since launch, 2,510 pathways and 1,849 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 8% of pathways (**Figure 1** and **Table 1**).

Table 1: Sex and neutered status

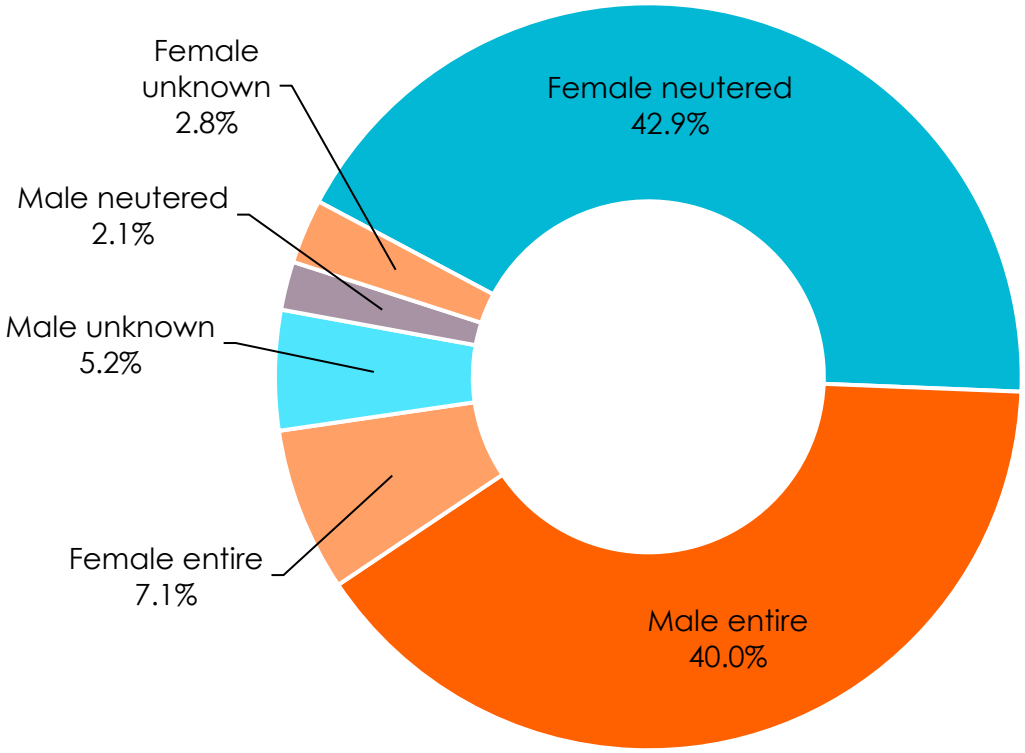
	Number (n)	%
Male entire	739	40.0
Female entire	131	7.1
Male neutered	39	2.1
Female neutered	793	42.9
Male unknown	96	5.2
Female unknown	51	2.8
Total	**1,849**	

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 3 months to 18 years. The average age of patients was 7.3 years (median=7.4 years). Age was recorded in 99.4% of pathways (n=2,447). The age recorded in six cases was outside the biologically possible range so these cases were excluded from this analysis.

The ages of patients ranged from 3 months to 18 years

Figure 1: Sex and neutered status



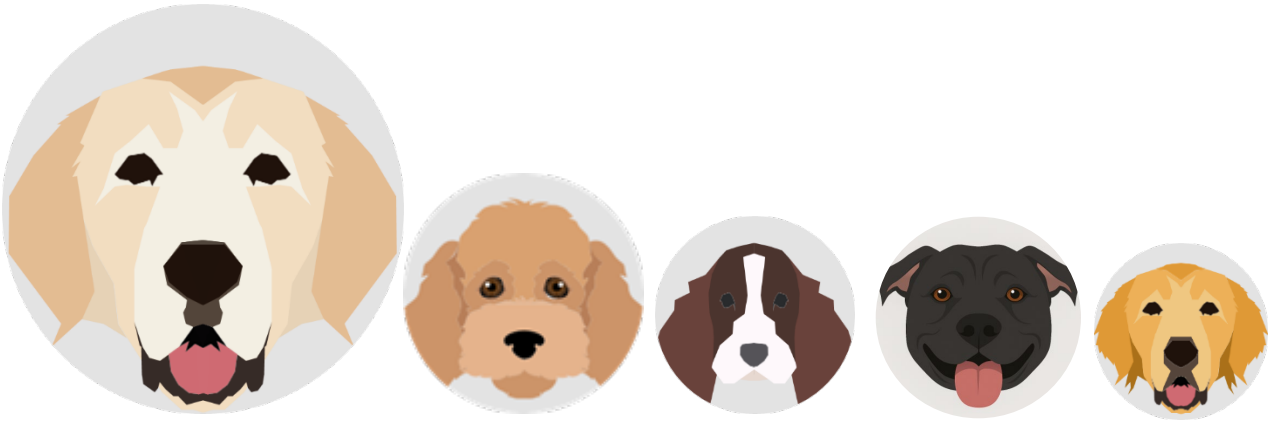
3.3 Breed

142 different breeds (or recognised variations) were reported (n=2,336 dogs). The five most common were Labrador retriever (9.4% n=219), cockapoo (5.0% n=118), English springer spaniel (4.3% n=101), Staffordshire bull terrier (4.3% n=101) and golden retriever (4.2% n=99) (**Figure 2**). 4.3% of patients were crossbreeds (n=101), though this figure does not include non-Kennel Club registerable 'designer breeds', which are recorded separately. The breed was unknown or not recorded in 10.3% of patients (n=240).

3.4 Body condition score

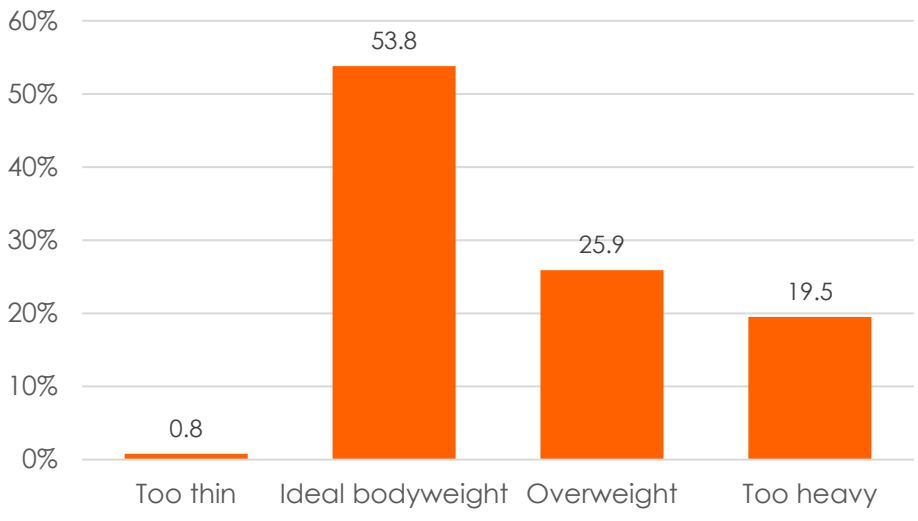
Body condition score was recorded by the veterinary surgeon following initial patient assessment in 48.5% of patient pathways (n=1,218) using the Royal Canin 9-point scale[5]. 0.8% of patients were classified as too thin and 53.8% were of ideal body weight, whereas 25.9% were overweight, and 19.5% were too heavy.

Figure 2: Most common breeds



Labrador retriever	Cockapoo	English springer spaniel	Staffordshire bull terrier	Golden retriever
9.4%	5%	4.3%	4.3%	4.2%

Figure 3: Body condition score



3.5 Body weight

Body weight was recorded in 72.8% of patient pathways (n=1,827). The average patient weighed 23.1kg ±12.3 (median 21.3). Weight ranged from 1.6kg–80.3kg. Variation by gender and neutered status is displayed in **Table 2**.

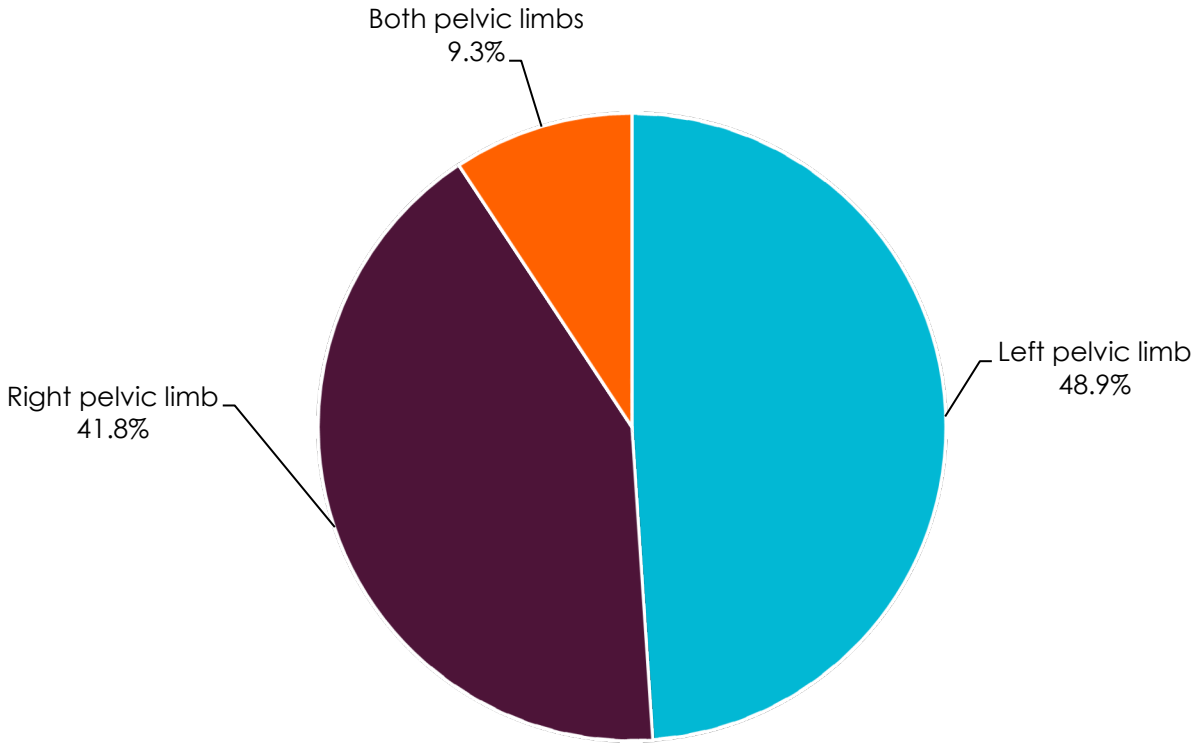
3.6 Affected limb

The affected limb was recorded in 96.0% of pathways (n=2,409). The left pelvic limb was affected in 48.9%, the right pelvic limb was affected in 41.8%, and the remainder were affected bilaterally (**Figure 4**).

Table 2: Body weight

	Mean (kg)	Median (kg)	SD (kg)	Range (kg)		Number (n)
Male neutered	22.5	21.0	11.9	1.6	80.3	730
Male entire	27.6	26.0	15.3	5.2	80.3	129
Male unknown	23.2	21.0	12.1	3.5	50	36
Female neutered	21.9	20.1	11.4	3.7	50	790
Female entire	29.6	28.1	13.2	4.4	61.5	97
Female unknown	25.7	23.0	13.3	6.9	57.6	45

Figure 4: Affected limb



4. CLINICAL ASSESSMENT

4.1 Lameness

Lameness at the time of presentation was assessed by the veterinary surgeon using a 6-point scale[6]. Lameness was graded in the affected limb in 50.9% of pathways (n=1,278) and in the unaffected limb in 40.4% of pathways (n=1,013). 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 in 95.3% of pathways (n=1,659) (**Figure 6**).

4.3 Clinical signs

Clinical signs were documented in 76.2% of patient pathways (n=1,913). When documented, Lameness was reported in 97.3% (n=1,862) of patient pathways, with stiffness after exercise reported in 17.1% (n=327) and reluctance to exercise reported in 11.3% (n=217). When recorded, 21.1% of patient pathways had previously had cruciate surgery on the contralateral limb (n=505) and another medical issue was reported in 23.9% of patient pathways (n=528).

4.4 Clinical examination findings

Clinical examination findings were reported in 76.6% (n=1,923) of pathways. When recorded, the most reported clinical findings were a stifle effusion (78.3% n=1,506) and cranial drawer (76.1% n=1,463) (**Table 4**).

Figure 5: Lameness grade

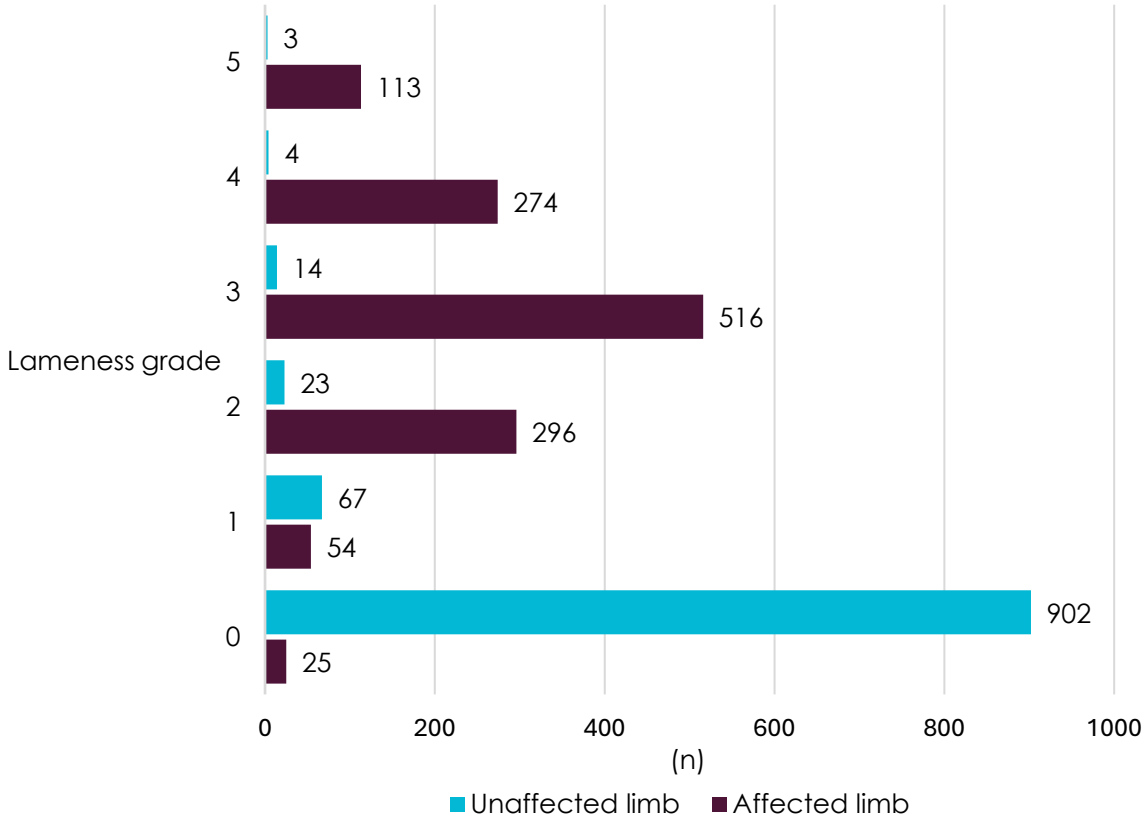


Table 3: Lameness grade

Lameness grade	Affected limb (n)	Unaffected limb (n)
0	25	902
1	54	67
2	296	23
3	516	14
4	274	4
5	113	3

Lameness was reported in 97.3% of pathways

Figure 6: Duration of lameness

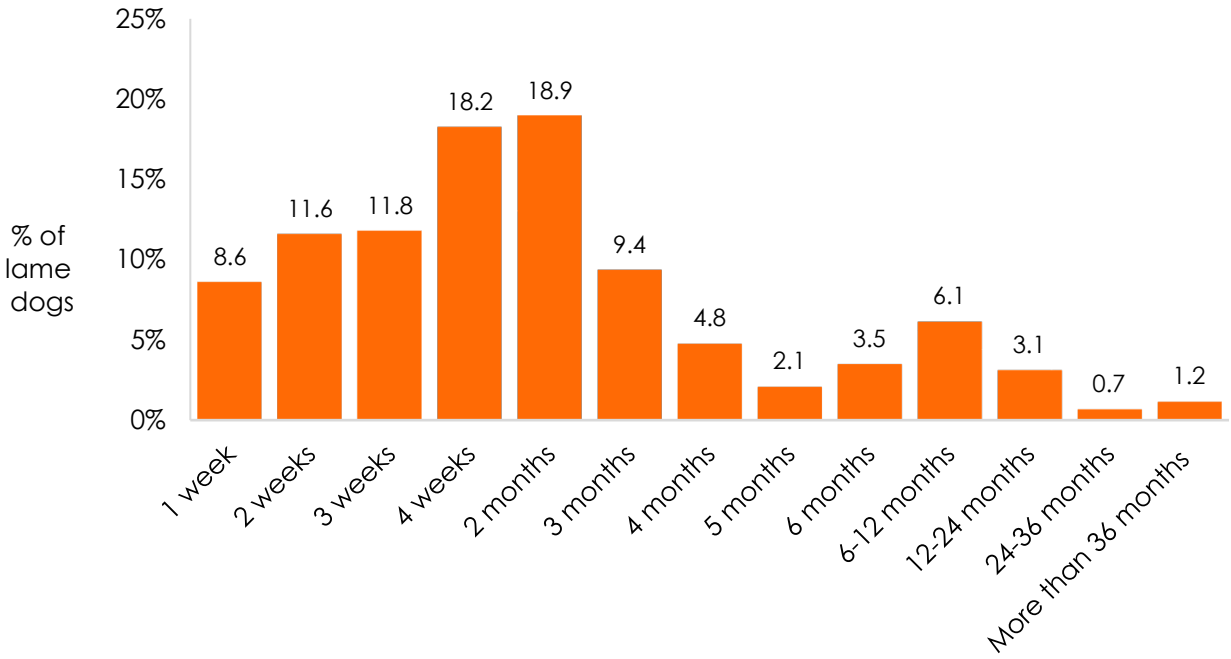


Table 4: Clinical examination findings

Clinical findings	Reported findings (n)
Stifle effusion	1,506
Cranial drawer	1,463
Tibial thrust	1,069
Pain in stifle joint	1,044
Medial buttress	869
Hind leg extension with sitting	474
Decreased range of motion	270
Crepitus	256
Other	213

5. SURGERY

5.1 Procedures

1,849 surgical procedures have been recorded since the launch of the registry, with a 40% rise in the past 12 months. This represents 73.7% of patient pathways. The majority of procedures were osteotomies (**Table 5**).

Table 5: Surgical procedures

	Number (n)	%
TPLO	1208	65.3
CCWO	481	26.0
TTA/MMP	92	5.0
Extracapsular	63	3.4
CBLO	5	0.3
Total	**1,849**	

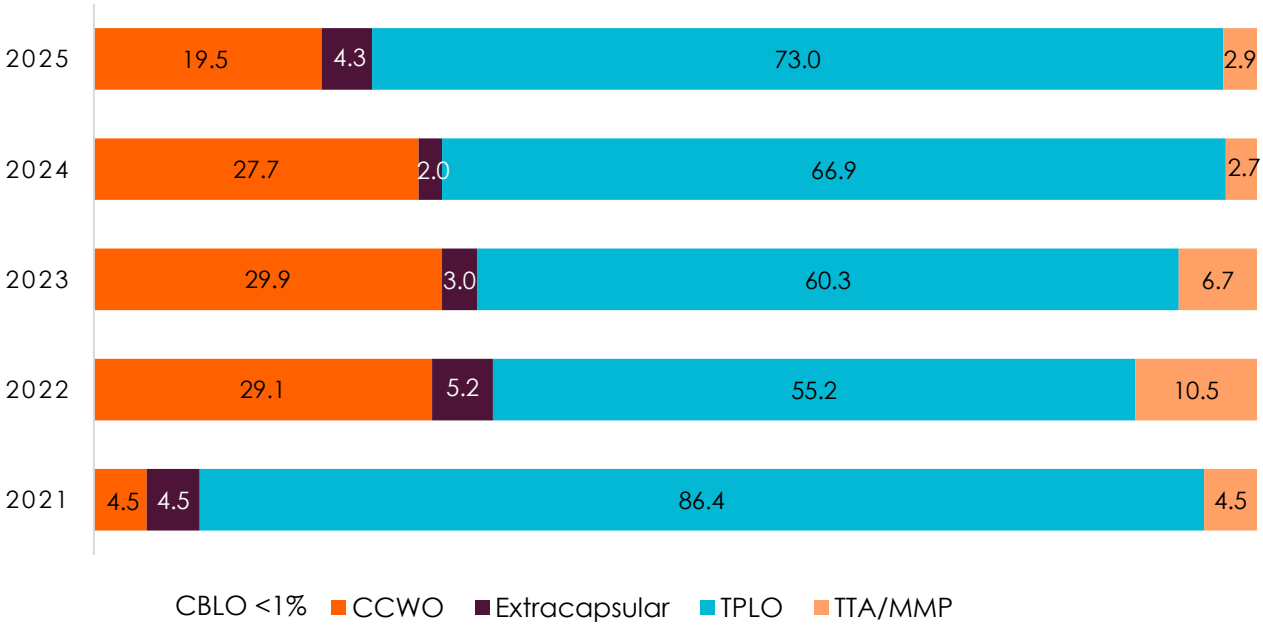
5.1.1 Annual variation/trends

There continues to be variation in procedures over time. The proportion of TPLO performed has increased by 6.1%, whereas the proportion of CCWO has decreased by 8.2%. There has been a 2.3% increase in the proportion of extracapsular procedures performed, while the proportion of Tibial Tuberosity Advancement (TTA)/Modified Maquet Procedure (MMP) remains consistent. CORA (Centre of Rotation of Angulation) Based Levelling Osteotomy (CBLO) accounts for less than 1% of procedures each year. **Table 6** and **Figure 7** show the number and proportion of surgical procedures by year respectively.

Table 6: Surgical procedures by year

	2021 (n)	2022 (n)	2023 (n)	2024 (n)	2025 (n)
TPLO	19	169	260	403	355
CCWO	1	89	129	167	95
TTA/MMP	1	32	29	16	14
Extracapsular	1	16	13	12	21
CBLO	0	0	0	4	1
Total	**22**	**306**	**431**	**602**	**486**

Figure 7: Percentage of surgical procedures by year



5.2 Intra-articular assessment

An intra-articular assessment was performed in 97.2% of procedures (n=1,798). When recorded, this was performed via an arthrotomy in 97.2% of patients (n=1,748) and arthroscopically in the remainder.

5.3 Cruciate tear

The degree of cranial cruciate ligament tear was recorded in 89.5% of procedures (n=1,654). 76.6% were complete tears and 23.4% were partial tears.

5.4 Medial meniscal assessment

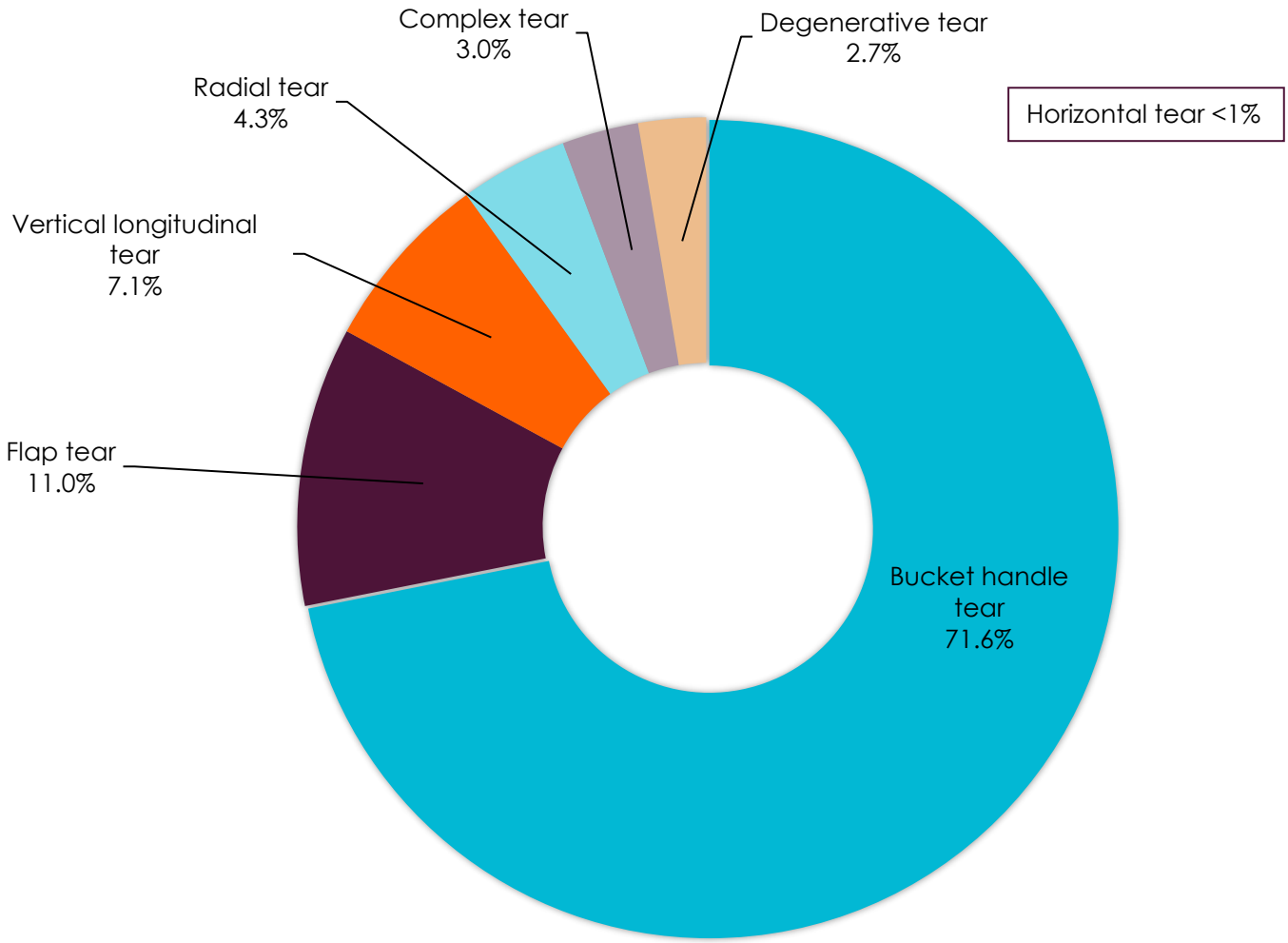
The state of the medial meniscus was recorded in 92.5% of the pathways when intra-articular assessment was performed (n=1,663). A medial meniscal tear was identified in 37.6% of these patients (n=625). The tear was classified in 90.2% (n=564) of these cases, with a bucket handle tear being most common (**Table 7** and **Figure 8**).

A meniscal tear was recorded in 42.2% of patients with a complete tear of the cranial cruciate ligament (n=535) vs 19.6% of patients with a partial tear (n=76).

Table 7: Meniscal tear type

Meniscal tear type	n	%
Bucket handle tear	404	71.6
Flap tear	62	11.0
Vertical longitudinal tear	40	7.1
Radial tear	24	4.3
Complex tear	17	3.0
Degenerative tear	15	2.7
Horizontal tear	2	0.4
Total	**564**	

Figure 8: Meniscal tear type



Most commonly reported meniscal tear: bucket handle tear

5.4.1 Meniscal treatment

A partial meniscectomy was performed in 94.6% of patients where a medial meniscal tear was reported (n=596). A meniscal release was reported in 5.4% of patients where a medial meniscal tear was reported (n=34).

5.5 Additional procedures

Additional procedures were performed in 6.9% (n=127) of procedures. Three additional procedures were reported: an additional osteotomy, correction of a medial patellar luxation, and placement of an anti-rotational suture. Both correction of a medial patellar luxation and placement of an anti-rotational suture were performed in four patients. Placement of an anti-rotational suture in isolation was only reported following TPLO (2.9% of TPLOs n=35) (**Table 8**).

Additional procedures were performed in 6.9% of surgeries

5.6 Regional anaesthesia

Regional anaesthesia/analgesia was used in 84.3% of patients (n=1,558). Most commonly this was a femoral and sciatic block. Regional anaesthesia classified as 'Other' mainly consisted of local splash blocks (**Table 9**).

Regional anaesthesia or analgesia was used in 84.3% of patients

Table 8: Additional procedures

Procedure	CCWO (n)	TPLO (n)	TTA/MMP (n)	Extracapsular (n)	Total
Anti-rotational suture	0	35	0	0	35
Medial patellar luxation correction	9	32	12	14	67
Medial patellar luxation correction with anti-rotational suture	2	1	0	1	4
Osteotomy	3	18	0	0	21
Total	**14**	**86**	**12**	**15**	**127**

Table 9: Regional anaesthesia

Regional anaesthesia	(n)	%
Femoral and sciatic nerve block	875	56.2
Epidural	414	26.6
Other	211	13.5
Sciatic nerve block	20	1.3
Intra-articular	19	1.2
Lumbar plexus	13	0.8
Femoral nerve block	6	0.4
Total	**1,558**	

5.7 Surgery and anaesthesia time

Total surgical time and anaesthesia time were recorded in 69.7% (n=1,289) and 61.8% (n=1,142) of procedures respectively. Mean surgical time was 77.7±29.0 minutes (median 80 minutes) with a range of 15–270 minutes. Mean anaesthesia time was 145.4±38.0 minutes (median 144 minutes) with a range of 40–240 minutes. There was some variation between procedures (**Table 10**).

5.8 Antibiotic usage

Peri-operative antibiotics were used in 99.9% of surgical procedures (n=1,847). Post-operative antibiotics were used following 35.9% of surgical procedures (n=663). The mean duration of the post-operative course was 5.24 days (median 5 days, range 1–14 days). The percentage of procedures receiving post-operative antibiotics has decreased by 19.3% from registry year 2021 to registry year 2025 (**Table 11**).

Table 11: Use of post-operative antibiotics

Registry year	Procedures	(n)*	%
2021	22	11	50.0
2022	306	136	44.4
2023	431	144	33.4
2024	602	192	31.9
2025	486	149	30.7
Overall	**1,847**	**632**	**34.2**

*Of procedures when recorded

Surgical time ranged from 15 to 270 minutes

Table 10: Surgery and anaesthesia time

	Surgical time				Anaesthesia time			
Procedure	**(n)***	**Mean time ±SD (mins)**	**Median (mins)**	**Range (mins)**	**(n)***	**Mean time ±SD (mins)**	**Median (mins)**	**Range (mins)**
CBLO	4	117.5±9.6	120	110-130	4	170±14.1	170	150-180
CCWO	333	91.7±27.8	95	20-270	264	151.8±37.8	160	40-240
Extracapsular	46	54.4±23.25	70	29-120	45	111.7+38.6	150	60-210
TPLO	831	74.2±27.7	60	30-255	749	144.8±35.4	120	57-240
TTA/MMP	75	66.4±24.8	80	15-150	80	146.5±50.9	155	40-240
Overall	**1,289**	**77.7±29.0**	**80**	**15-270**	**1,142**	**145.4±38.0**	**144**	**40-240**

*Of procedures when recorded

Most common anaesthesia or analgesia technique: femoral and sciatic nerve block

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 Orthopaedic Index (COI) questionnaire

6. OUTCOMES

6.1 Assessment

Primarily, outcomes are assessed using client-reported outcome measures (CROMs). Owners are asked to complete both a baseline Liverpool Osteoarthritis in Dogs (LOAD) questionnaire and a Canine Orthopaedic Index questionnaire (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 12**.

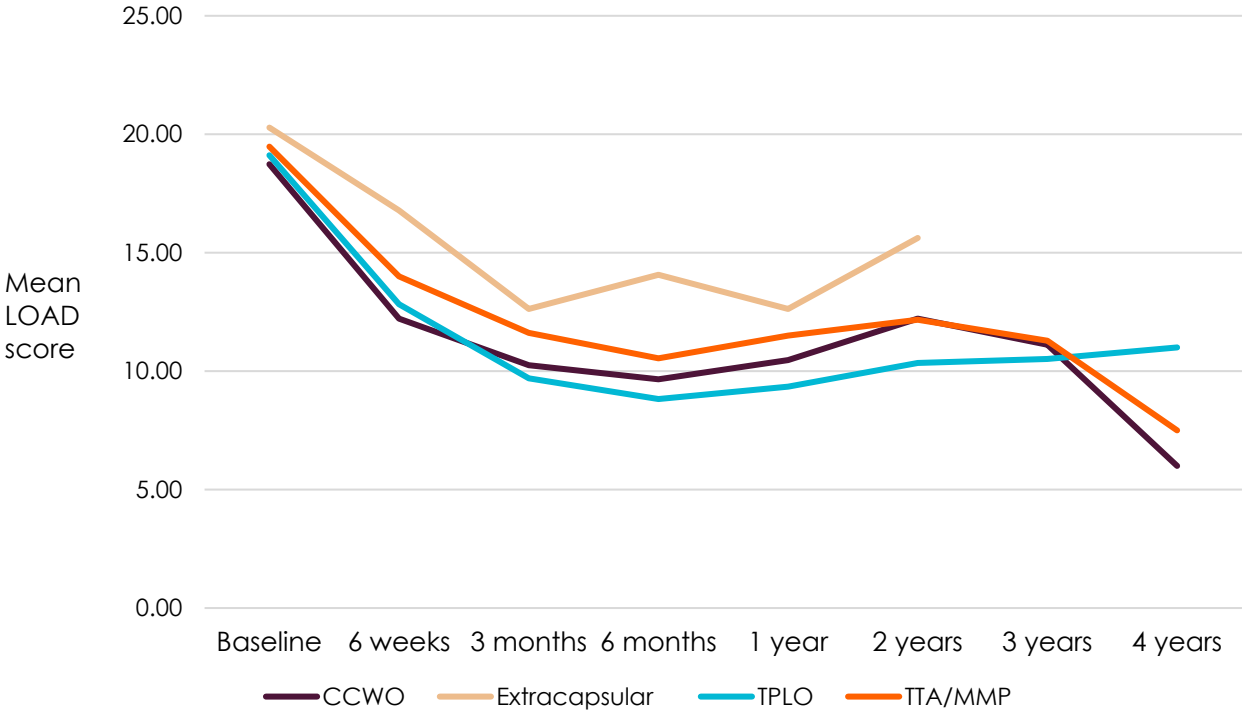
6.2 Procedure

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

Table 12: Completed outcome measures

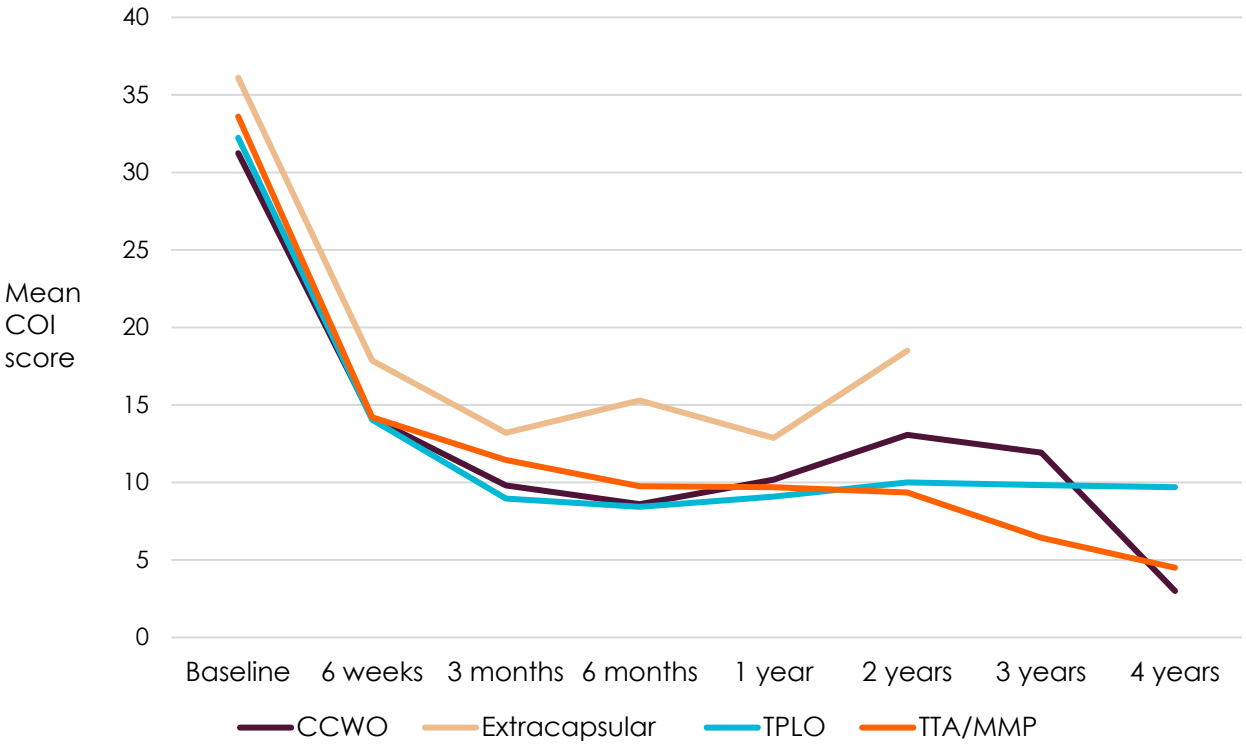
		CBLO	CCWO	Extracapsular	TPLO	TTA/MMP
Baseline (n)	**LOAD**	5	433	57	1,079	86
	COI	5	428	56	1,063	86
6 weeks (n)	**LOAD**	5	226	23	684	54
	COI	4	221	22	666	53
3 months (n)	**LOAD**	3	215	24	608	49
	COI	3	212	24	600	49
6 months (n)	**LOAD**	1	202	28	518	37
	COI	1	201	27	513	37
1 year (n)	**LOAD**	2	149	16	410	26
	COI	2	147	16	407	26
2 years (n)	**LOAD**	0	69	8	181	18
	COI	0	69	8	180	17
3 years (n)	**LOAD**	0	26	0	68	7
	COI	0	26	0	64	7
4 years (n)	**LOAD**	0	2	0	13	2
	COI	0	2	0	13	2

Figure 9: Mean LOAD score by procedure



CBLO data has been omitted due to the small number of cases and lack of follow-up.

Figure 10: Mean COI score by procedure



CBLO data has been omitted due to the small number of cases and lack of follow-up.

6.3 Partial vs complete tear

The effect 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.

Figure 11: Mean LOAD score vs cruciate tear

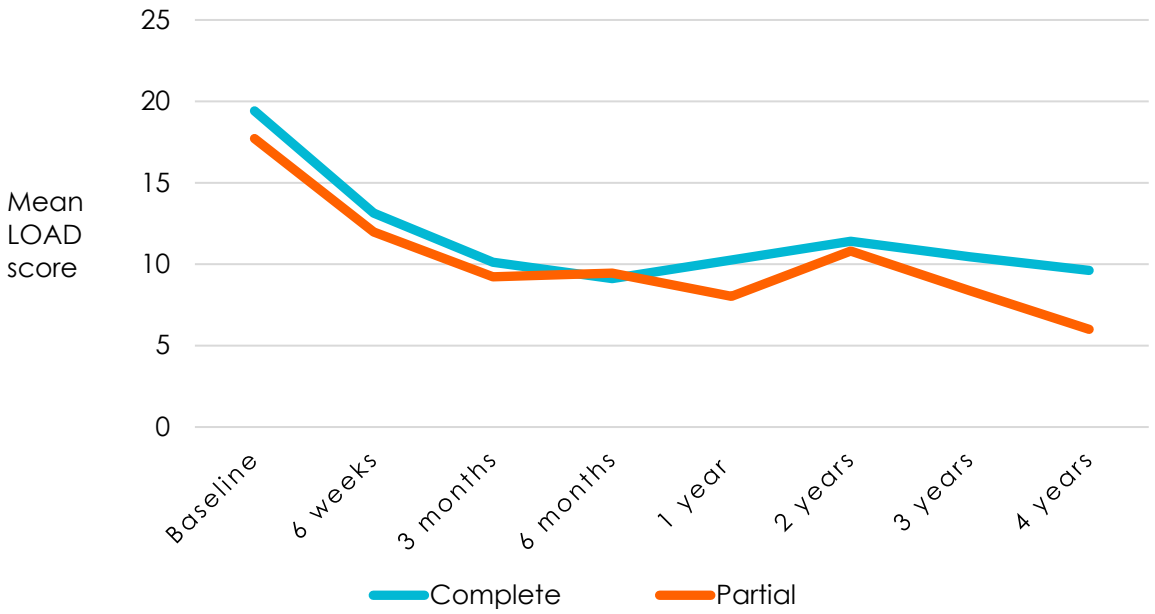
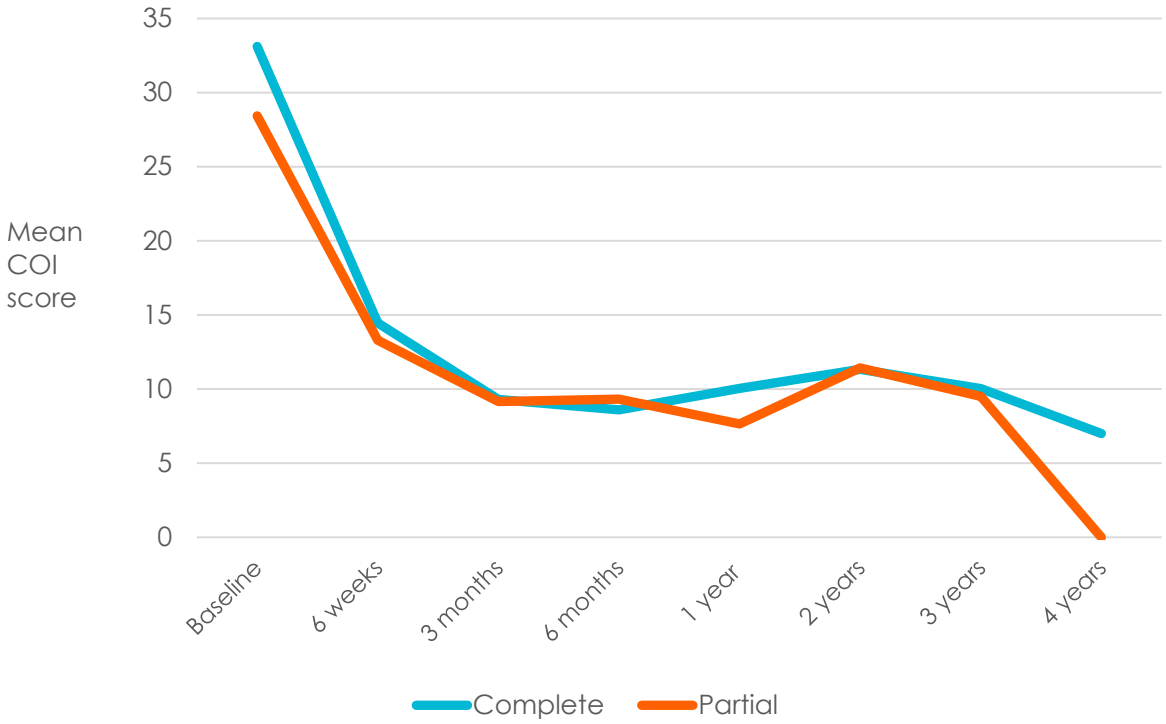


Figure 12: Mean COI score vs cruciate tear



6.4 Meniscal tear

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

Figure 13: Mean LOAD score vs meniscal tear

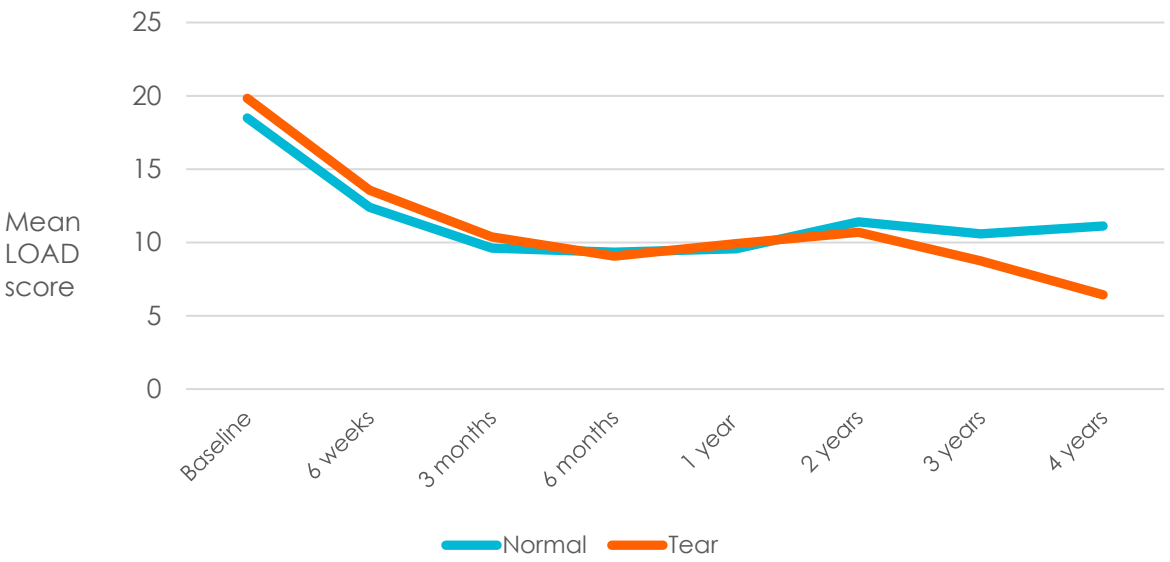
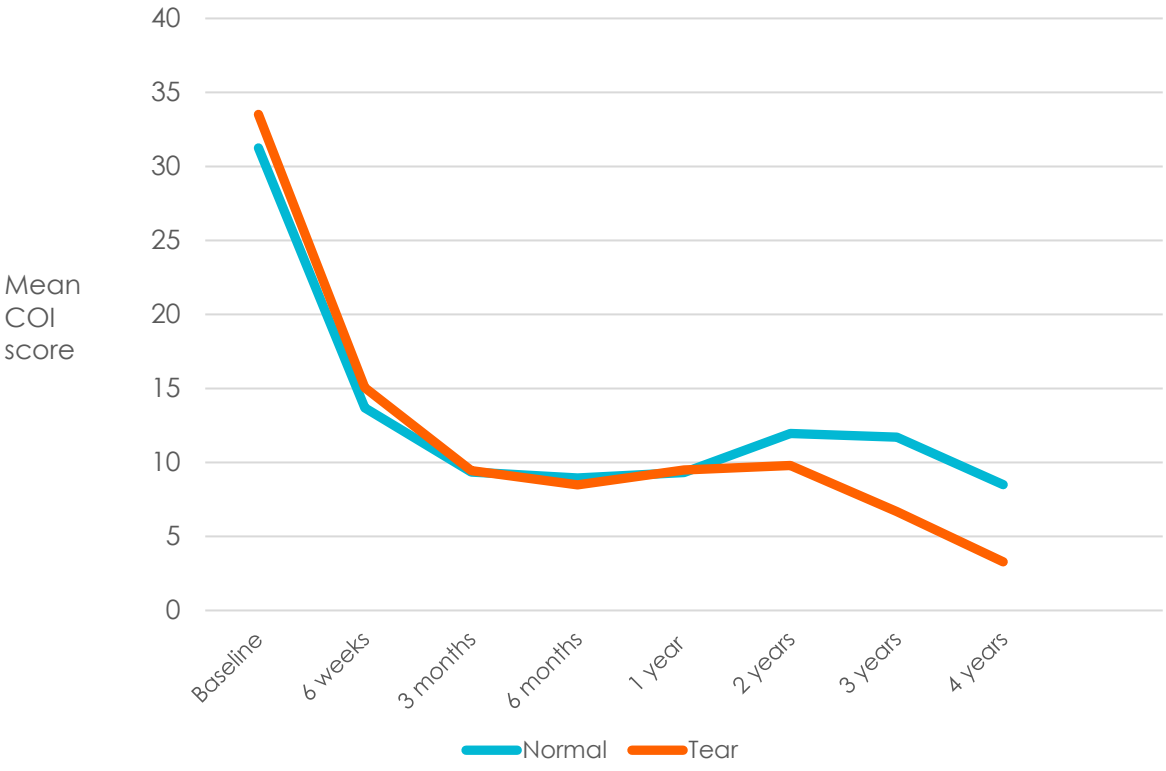


Figure 14: Mean COI score vs meniscal tear




There was an improvement in outcome scores following surgery with all procedures

6.5 Owner assessment of function

Owners were asked to rate their dog's function after surgery, 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 13** and **Figure 15**).

The majority of owners rated their pet's function as 'much better' than before surgery

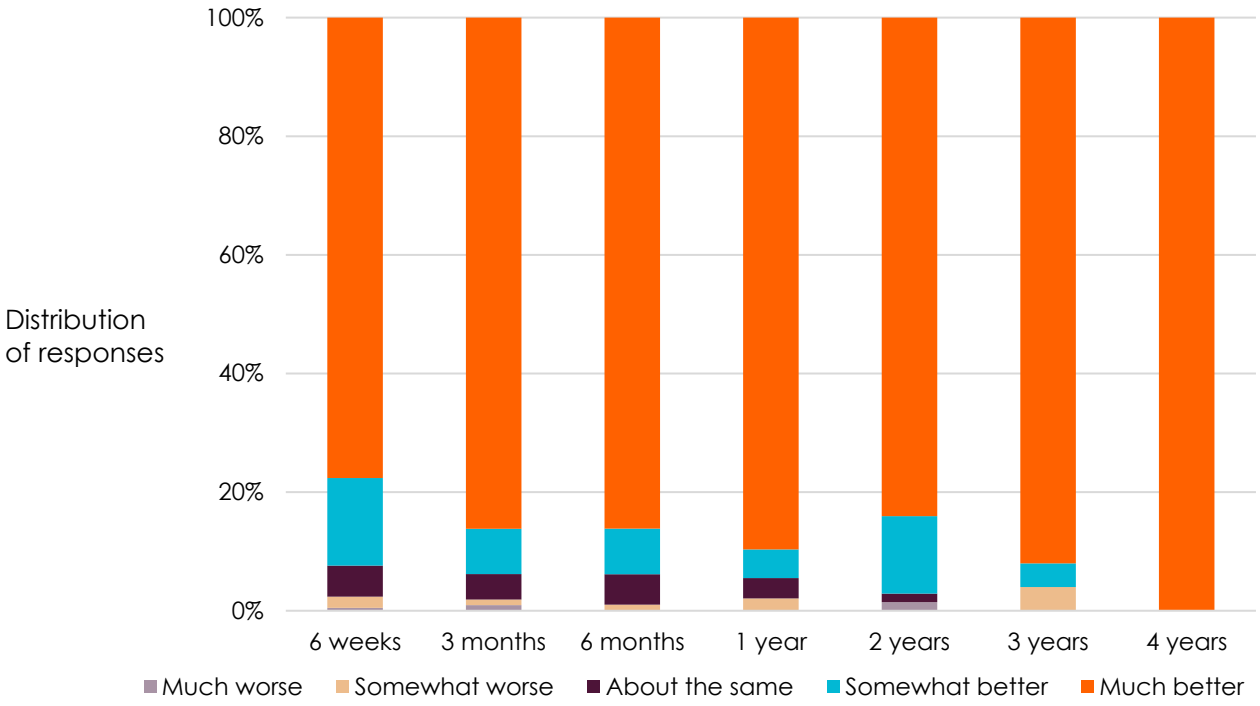
Follow-up questionnaires are sent after a procedure at 6 weeks, 12 weeks, 6 months, 1 year and then at yearly intervals

Table 13: Owner rating of leg function post-operation

	Much worse	Somewhat worse	About the same	Somewhat better	Much better
CBLO					
6 weeks	0.0%	25.0%	0.0%	50.0%	25.0%
3 months	0.0%	0.0%	0.0%	66.7%	33.3%
6 months	0.0%	0.0%	0.0%	0.0%	100.0%
1 year	0.0%	0.0%	0.0%	0.0%	100.0%
CCWO					
6 weeks	0.5%	1.9%	5.2%	14.8%	77.6%
3 months	1.0%	1.0%	4.3%	7.6%	86.2%
6 months	0.0%	1.0%	5.1%	7.7%	86.2%
1 year	0.0%	2.1%	3.4%	4.8%	89.7%
2 years	1.4%	0.0%	1.4%	13.0%	84.1%
3 years	0.0%	4.0%	0.0%	4.0%	92.0%
4 years	0.0%	0.0%	0.0%	0.0%	100.0%
Extracapsular					
6 weeks	0.0%	5.3%	0.0%	10.5%	84.2%
3 months	0.0%	4.2%	8.3%	8.3%	79.2%
6 months	0.0%	0.0%	7.4%	18.5%	74.1%
1 year	0.0%	0.0%	6.3%	18.8%	75.0%
2 years	0.0%	0.0%	25.0%	0.0%	75.0%
TPLO					
6 weeks	0.8%	2.2%	6.9%	17.3%	72.8%
3 months	0.7%	0.7%	3.4%	9.0%	86.3%
6 months	0.4%	1.2%	2.6%	7.1%	88.8%
1 year	1.0%	1.5%	3.2%	6.9%	87.4%
2 years	0.0%	2.3%	5.1%	5.6%	87.0%
3 years	0.0%	3.2%	3.2%	9.7%	83.9%
4 years	0.0%	0.0%	0.0%	15.4%	84.6%
TTA/MMP					
6 weeks	0.0%	0.0%	42.9%	42.9%	14.3%
3 months	0.0%	20.0%	20.0%	40.0%	20.0%
6 months	0.0%	12.5%	37.5%	37.5%	12.5%
1 year	0.0%	11.1%	0.0%	77.8%	11.1%
2 years	0.0%	0.0%	0.0%	17.6%	82.4%
3 years	0.0%	0.0%	14.3%	0.0%	85.7%
4 years	0.0%	0.0%	0.0%	0.0%	100.0%

Figure 15: Owner rating of leg function post-operation

a) CCWO



b) Extracapsular

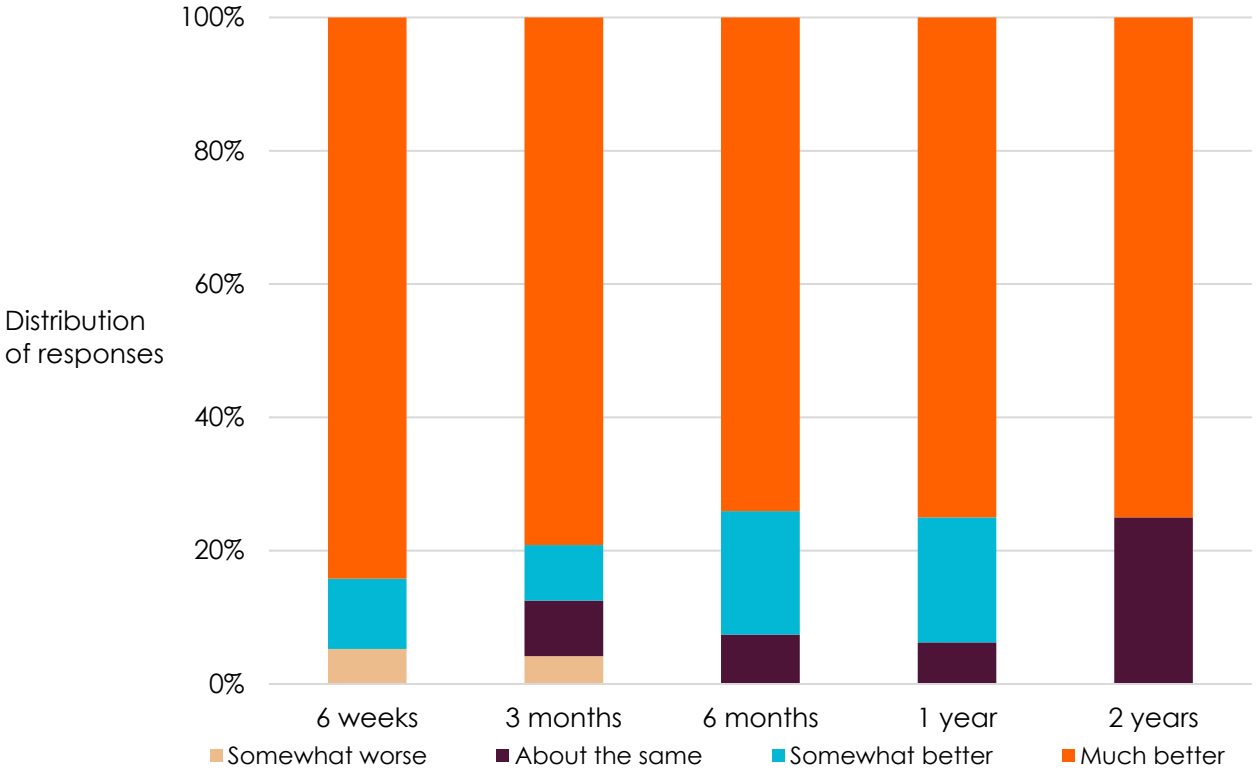
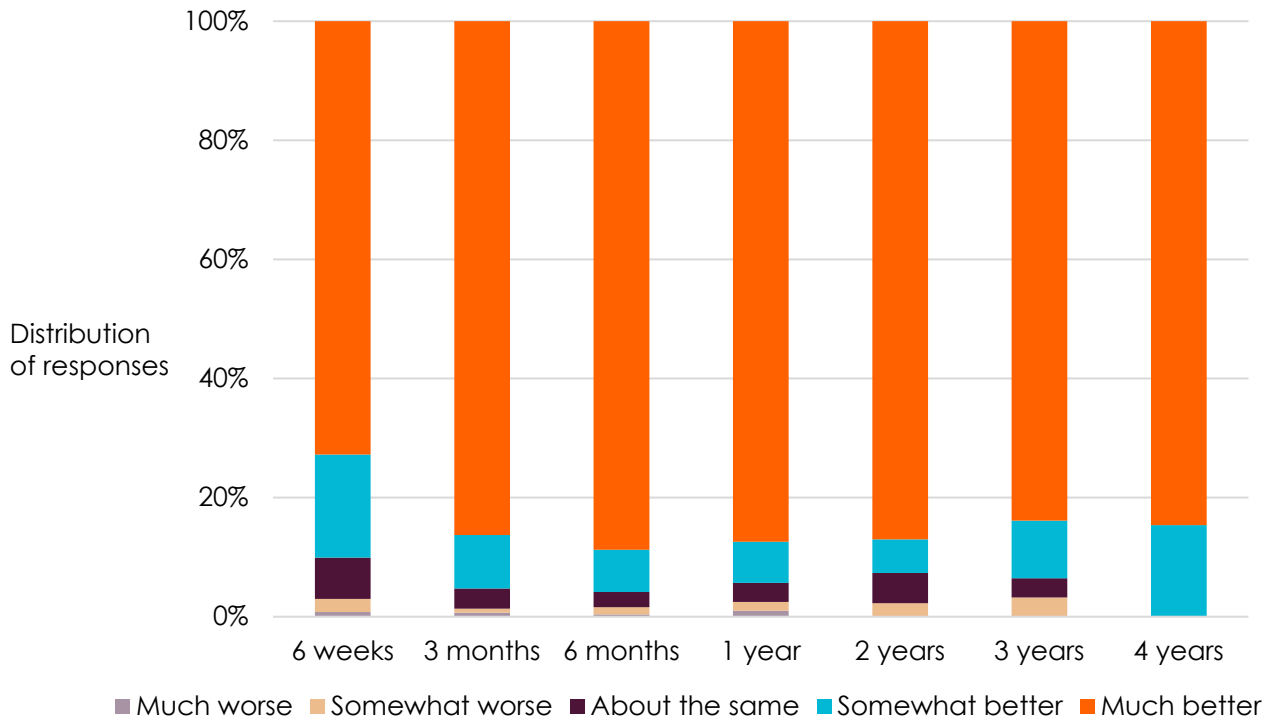
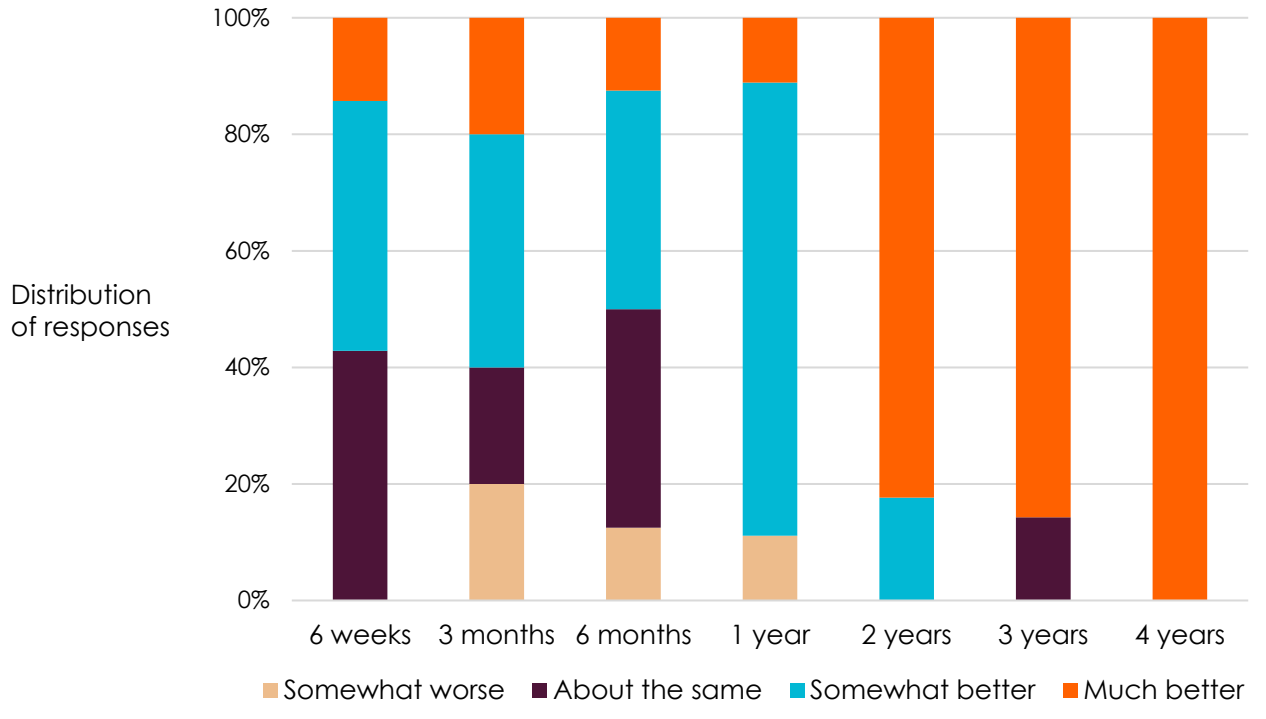


Figure 15: Owner rating of leg function post-operation *continued*

c) TPLO



d) TTA/MMP



CBLO data has been omitted due to the small number of cases and lack of follow-up.

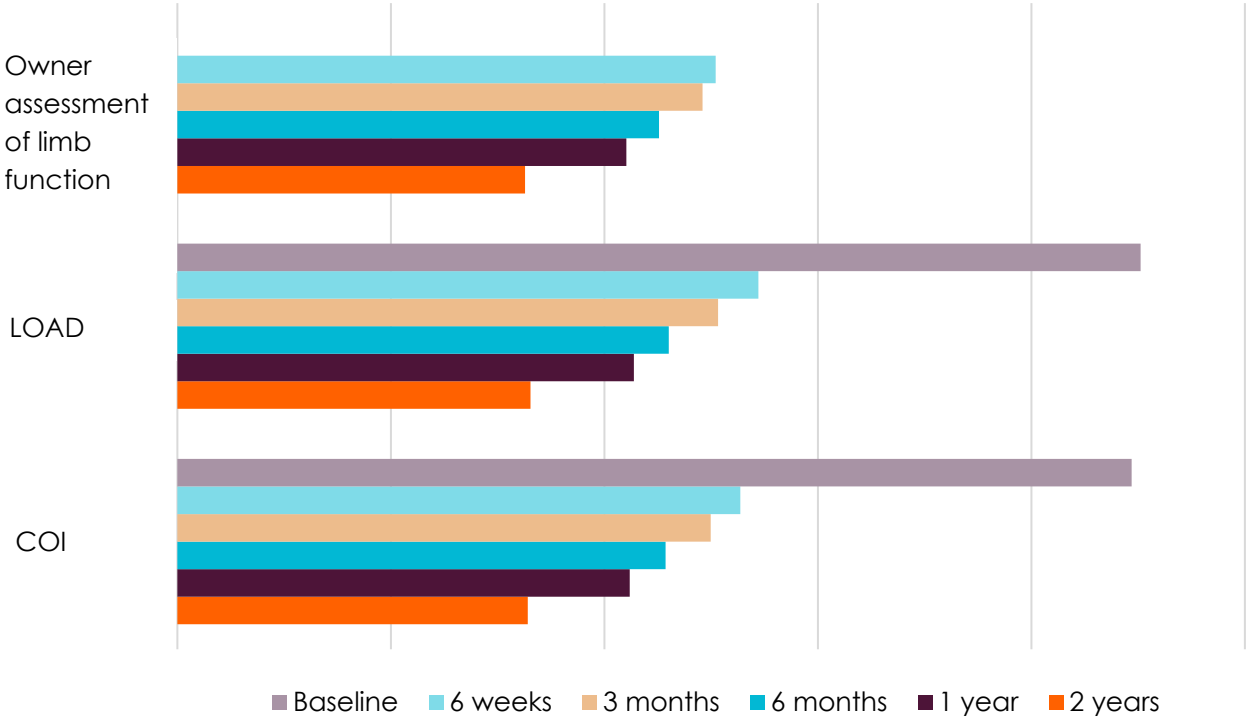
6.6 Compliance

Compliance is defined as the proportion of requested outcome measures completed at each time interval. This is calculated from all pathways with a surgical procedure (pathways with a baseline outcome measure completed without a subsequent surgical procedure are excluded). Compliance is estimated with this methodology, as missing data at one time point does not mean subsequent surveys are not completed (**Table 14** and **Figure 16**).

Table 14: Compliance

Compliance	Baseline	6 weeks	3 months	6 months	1 year	2 years
Owner assessment of limb function	N/A	50.4%	49.2%	45.1%	42.1%	32.6%
LOAD	90.2%	54.4%	50.7%	46.0%	42.8%	33.1%
COI	89.4%	52.7%	50.0%	45.7%	42.4%	32.8%

Figure 16: Client-reported outcome measure compliance



7. ADVERSE EVENTS

7.1 Incidence

Intra-operative adverse events were reported in 5.9% of surgical procedures (n=109). More than one adverse event was reported in 0.5% of procedures (n=10).

7.2 Type of event

The most common adverse event was significant haemorrhage (n=25) (**Table 15**). The other adverse events reported included a range of issues relating to equipment, implants, regurgitation, and anaesthesia.

Table 15: Adverse events

Adverse event	Number (n)	%
Significant haemorrhage	25	1.4
Screw in joint	7	0.4
Broken holding pin	4	0.2
Fibular fracture	4	0.2
Hinge break	4	0.2
Screw placed in osteotomy	4	0.2
Break in aseptic technique	3	0.2
Broken screw/anchor	2	0.1
Distal cortex fracture	2	0.1
Broken drill bit	1	0.1
Incorrect bone tunnel position	1	0.1
Malalignment	1	0.1
Tibial fracture	1	0.1
Wire cut through bone	1	0.1
Other	59	3.2
Total	**119**	

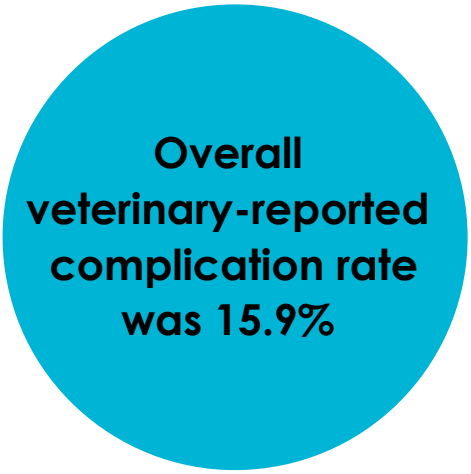
Haemorrhage was the most commonly reported adverse event

Veterinary surgeons can report complications as they occur or at the time of a follow-up assessment

8. COMPLICATIONS

8.1 Reporting

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.



8.2 Complication rates

A complication represents a pathway where one or more complications were reported. The overall veterinary-reported complication rate was 15.9% (n=294). The overall owner-reported complication rate was 15.1% (n=279). The variation in procedure is shown in **Table 16** and **Figure 17**. The complications reported by time frame are shown in **Figure 18**.

The veterinary-reported complications, frequency of occurrence and time frame are listed in **Appendix 1 (Table 17** and **Table 18)**. The owner-reported complications, frequency of occurrence and time frame are listed in **Appendix 2 (Table 19** and **Table 20)**.

Table 16: Complication rates by procedure

Procedure		Complications			
		Vet reported		Owner reported	
	n	%	n	%	n
CBLO	5	40.0	2	20.0	1
CCWO	481	14.8	71	13.3	64
Extracapsular	63	4.8	3	4.8	3
TPLO	1,208	16.8	203	15.9	192
TTA/MMP	92	16.3	15	20.7	19
Overall	**1,849**	**15.9**	**294**	**15.1**	**279**

Figure 17: Complication rates by procedure

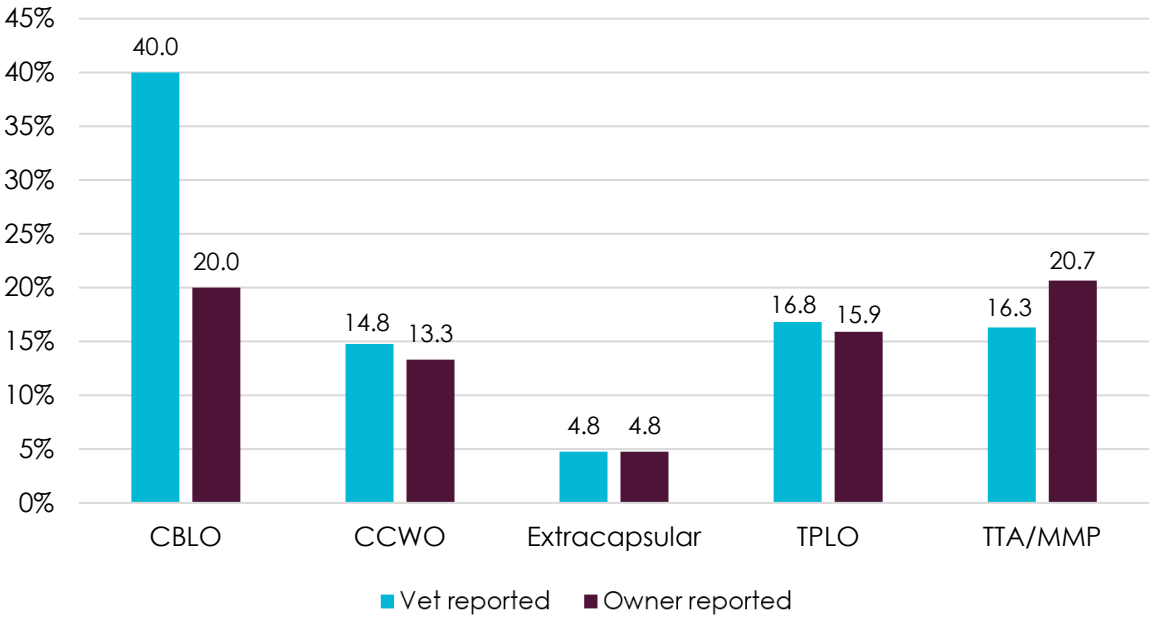
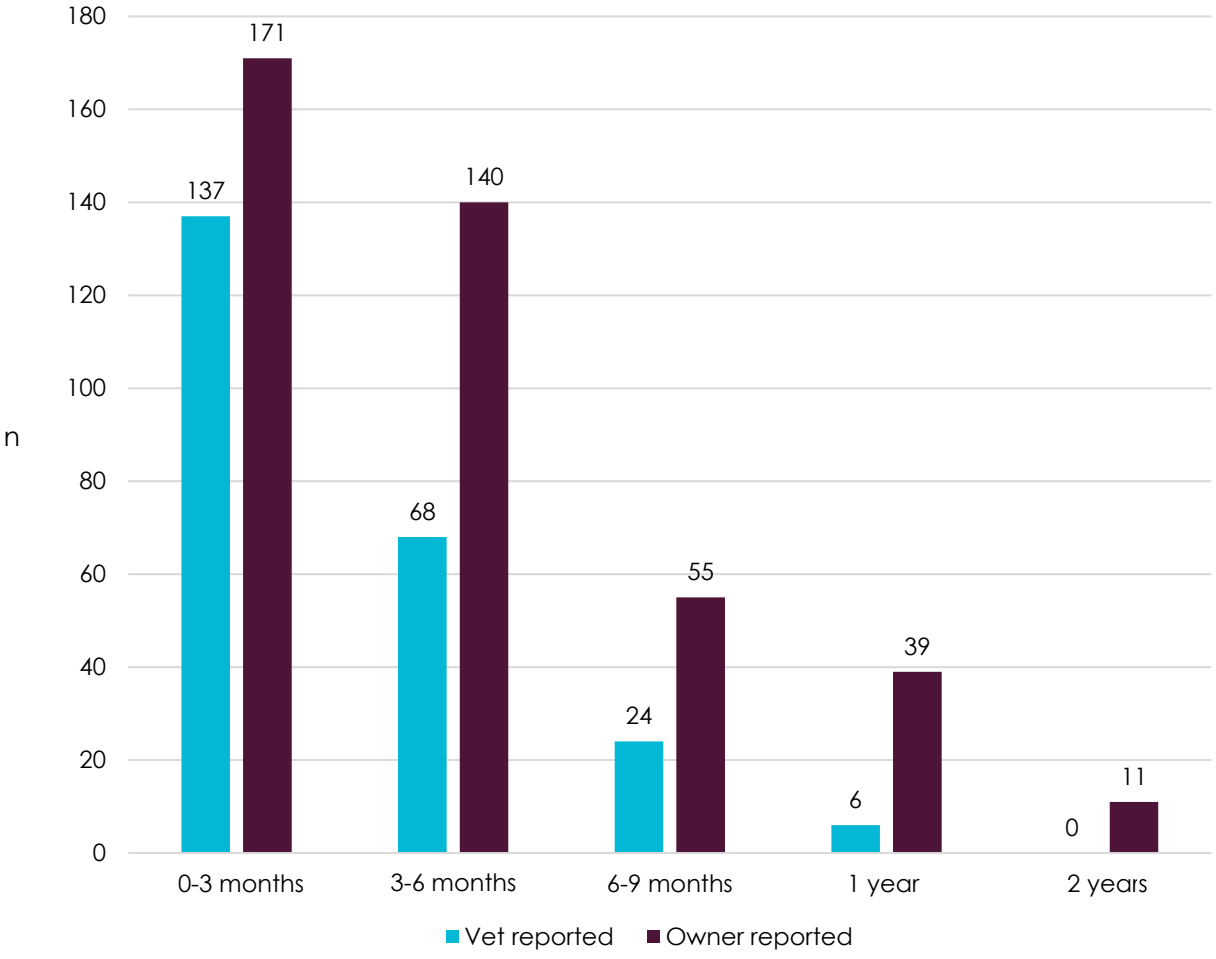


Figure 18: Complication rates by time frame



9. FUTURE FOCUS AND DEVELOPMENT

We are committed to expanding participation in the CCR, inspiring those already involved to continue their invaluable contributions, and reaching out in new areas where increased representation is crucial.

This includes enhancing data collection for extracapsular procedures and encouraging veterinary surgeons of all designations, building on data from specialists and general practitioners. By building a comprehensive dataset that reflects all demographics and procedures, we aim to support informed shared decision-making to benefit all dogs with canine cruciate ligament rupture.

Our next step is to expand international involvement with the Registry to make it a truly global resource that can help improve cruciate management worldwide. In addition, the volume and quality of the data accrued means we can now define research questions the Registry can address. In the coming year we will invite colleagues across various groups and organisations to work with us on this analysis – watch this space.

However, future progress depends on the continued action of participating veterinary surgeons. The Registry provides an innovative platform to support veterinary surgeons in their clinical auditing activity. These annual reports are provided as a benchmark. If you've submitted data to the Registry, compare your results with those presented in this report, and use the personalised reporting function within the Registry to support quality improvement in your practice.

If you are passionate about our data and wish to work on a specific project to uncover new insights, please reach out. Together, we can improve outcomes, and minimise complications, for all patients undergoing cruciate surgery. Email us at ebvm@rcvsknowledge.org

10. INFORMATION FOR USERS

Are you a dog owner?

Discover how the CCR could benefit dogs in the UK.

caninecruciateregistry.org/dog-owners

Do you work in veterinary practice?

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

caninecruciateregistry.org/veterinary-professionals

Are you ready to start contributing to the CCR?

Sign up to take part.

caninecruciateregistry.org/veterinaryprofessionals/vet-surgeons-registration-form

Do you want to know more about cruciate ruptures?

Learn about the most common surgical procedures.

caninecruciateregistry.org/dog-owners/common-surgical-procedures

APPENDIX 1:
VETERINARY-REPORTED COMPLICATIONS

Table 17: Veterinary-reported complications

Complication	Procedure	0-3 months (n)	3-6 months (n)	6-9 months (n)	1 year (n)	2 years (n)
Bandage complications	CBLO	0	0	0	0	0
	CCWO	0	0	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	1	0	0	0	0
	TTA/MMP	0	0	0	0	0
Delayed union	CBLO	0	0	0	0	0
	CCWO	1	0	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	3	4	0	0	0
	TTA/MMP	0	0	0	0	0
Draining tract	CBLO	0	0	0	0	0
	CCWO	2	0	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	6	3	0	0	0
	TTA/MMP	3	0	0	0	0
Fibular fracture	CBLO	0	0	0	0	0
	CCWO	1	1	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	7	1	0	0	0
	TTA/MMP	0	0	0	0	0
Implant failure	CBLO	0	0	0	0	0
	CCWO	3	1	1	0	0
	Extracapsular	0	0	0	0	0
	TPLO	0	0	0	0	0
	TTA/MMP	0	0	0	0	0
Incisional oedema/ haematoma/bruising	CBLO	0	0	0	0	0
	CCWO	0	0	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	2	2	0	0	0
	TTA/MMP	0	0	0	0	0
Infection	CBLO	1	1	0	0	0
	CCWO	10	3	0	0	0
	Extracapsular	1	0	0	0	0
	TPLO	41	19	3	0	1
	TTA/MMP	5	2	1	0	0

Table 17: Veterinary-reported complications *continued*

Complication	Procedure	0-3 months (n)	3-6 months (n)	6-9 months (n)	1 year (n)	2 years (n)
Kirschner wire loosening	CBLO	0	0	0	0	0
	CCWO	1	0	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	0	0	0	0	0
	TTA/MMP	0	0	0	0	0
Late meniscal tear	CBLO	0	0	0	0	0
	CCWO	0	0	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	2	3	1	0	1
	TTA/MMP	0	0	0	0	0
Medial patellar luxation	CBLO	0	0	0	0	0
	CCWO	5	4	2	1	0
	Extracapsular	0	0	0	0	0
	TPLO	1	11	8	2	1
	TTA/MMP	1	0	0	0	0
Meniscal tear	CBLO	1	0	0	0	0
	CCWO	15	12	7	3	1
	Extracapsular	1	0	1	0	0
	TPLO	40	21	10	5	5
	TTA/MMP	5	0	0	0	0
Other	CBLO	0	0	0	0	0
	CCWO	0	0	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	1	0	0	0	0
	TTA/MMP	0	0	0	0	0
Patellar fracture	CBLO	0	0	0	0	0
	CCWO	0	1	0	0	0
	TPLO	0	0	0	0	0
	TTA/MMP	15	8	0	0	0
	Extracapsular	0	0	0	0	0
Patellar tendonitis	CBLO	0	0	0	0	0
	CCWO	0	0	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	3	0	0	0	0
	TTA/MMP	0	0	0	0	0
Residual joint laxity	CBLO	0	0	0	0	0
	CCWO	6	1	1	0	0
	Extracapsular	0	0	0	0	0
	TPLO	8	1	0	0	0
	TTA/MMP	0	0	0	0	0

Table 17: Veterinary-reported complications *continued*

Complication	Procedure	0-3 months (n)	3-6 months (n)	6-9 months (n)	1 year (n)	2 years (n)
Rotational instability	CBLO	0	0	0	0	0
	CCWO	0	0	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	3	0	1	0	0
	TTA/MMP	0	0	0	0	0
Screw loosening	CBLO	0	0	0	0	0
	CCWO	8	4	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	19	4	2	0	0
	TTA/MMP	1	0	0	0	0
Seroma/swelling	CBLO	0	0	0	0	0
	CCWO	0	0	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	2	0	0	0	0
	TTA/MMP	1	0	0	0	0
Tibial fracture	CBLO	0	0	0	0	0
	CCWO	2	1	1	0	0
	Extracapsular	0	0	0	0	0
	TPLO	0	2	0	0	0
	TTA/MMP	3	0	0	0	0
Tibial tuberosity fracture	CBLO	0	0	0	0	0
	CCWO	2	0	0	0	0
	Extracapsular	0	0	0	0	0
	TPLO	5	0	0	0	0
	TTA/MMP	0	0	0	0	0
Traumatic wound dehiscence	CBLO	0	0	0	0	0

The following complications are selectable options but were not reported: anchor failure, bone tunnel widening, extracapsular suture failure, iatrogenic tibial deformity, lateral patellar luxation, osteomyelitis, patella alta, patella baja, peroneal nerve injury, ring sequestrum, tibial deformity.

Table 18: Veterinary-reported complications by procedure

Procedure	Number of procedures (n)	Number of complications (n)	0-3 months (n)	3-6 months (n)	6-9 months (n)	1 year (n)	2 years (n)
CBLO	5	3	2	1	0	0	0
CCWO	481	102	57	28	12	4	1
Extracapsular	63	3	2	0	1	0	0
TPLO	1,208	264	152	71	26	7	8
TTA/MMP	92	46	35	10	1	0	0

APPENDIX 2
OWNER-REPORTED COMPLICATIONS

Table 19: Owner-reported complications

Complication	Procedure	0-3 months (n)	3-6 months (n)	6-9 months (n)	1 year (n)	2 years (n)
Clicking/grinding sound	CBLO	0	0	0	0	0
	CCWO	3	0	1	1	0
	Extracapsular	0	0	0	0	0
	TPLO	7	1	1	0	2
	TTA/MMP	1	0	0	0	0
Inability to walk	CBLO	0	0	0	0	0
	CCWO	3	0	0	0	0
	Extracapsular	1	1	0	0	0
	TPLO	13	8	0	0	1
	TTA/MMP	2	2	0	1	0
Infection – deep	CBLO	0	0	0	0	0
	CCWO	3	1	1	1	0
	Extracapsular	0	0	0	0	0
	TPLO	18	7	1	0	1
	TTA/MMP	2	2	0	0	0
Infection – skin only	CBLO	0	0	0	0	0
	CCWO	5	3	2	1	0
	Extracapsular	1	0	0	0	0
	TPLO	12	3	0	0	1
	TTA/MMP	1	0	0	0	0
Joint/leg swelling	CBLO	0	0	0	0	0
	CCWO	7	4	3	1	0
	Extracapsular	0	0	0	0	0
	TPLO	28	15	3	0	1
	TTA/MMP	2	1	0	0	0
Ongoing pain	CBLO	1	1	0	0	0
	CCWO	5	1	1	0	0
	Extracapsular	1	1	0	0	0
	TPLO	24	13	2	1	0
	TTA/MMP	3	2	0	0	0

Table 19: Owner-reported complications *continued*

Complication	Procedure	0-3 months (n)	3-6 months (n)	6-9 months (n)	1 year (n)	2 years (n)
Other	CBLO	0	0	0	0	0
	CCWO	19	8	1	0	0
	Extracapsular	1	0	0	0	0
	TPLO	54	12	2	1	0
	TTA/MMP	2	0	0	0	0
Wound problems	CBLO	0	0	0	0	0
	CCWO	1	1	1	0	0
	Extracapsular	0	0	0	0	0
	TPLO	27	8	3	1	1
	TTA/MMP	2	2	0	0	0

Table 20: Owner-reported complications by procedure

Procedure	Number of procedures (n)	Number of complications (n)	0-3 months (n)	3-6 months (n)	6-9 months (n)	1 year (n)	2 years (n)
CBLO	5	2	1	1	0	0	0
CCWO	481	78	46	18	10	4	0
Extracapsular	63	6	4	2	0	0	0
TPLO	1,208	272	183	67	12	3	7
TTA/MMP	92	25	15	9	0	1	0

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

GLOSSARY

A

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 Orthopaedic Index questionnaire

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.

L

LOAD: Liverpool Osteoarthritis in Dogs questionnaire

M

Meniscus: A cartilage shock absorber inside the knee

Meniscectomy: Removal of 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

R

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.

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RCVS Knowledge would like to thank 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.

The RCVS Knowledge Canine Cruciate Registry uses 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 Orthopaedic Index, developed by the American College of Veterinary Surgeons.

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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.

RCVS Knowledge is a charity with a mission to advance the quality of veterinary care for the benefit of animals, the public and society.

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