

Leptospirosis update for the year 2024

Dear colleagues,

As 2024 is coming to an end, we would like to give you a summary of the canine leptospirosis cases seen in 2024 in New South Wales.

In 2024 there were 11 cases, 1 in January (Jewells, Newcastle), 1 in February (Albury, Victorian border), 2 in March (Wollamia and Browns Mountain, South Coast), 2 in April (East Kangaloon, Southern Highlands; Bellevue Hill, Eastern suburbs), 3 in June (Vincentia, South Coast; Kangaroo Valley, Local Government Area (LGA) Shoalhaven; Weston, near Canberra), 1 in August (Matraville, Sydney Eastern suburbs) and 1 in September (Bondi Junction, Sydney Eastern suburbs). Diagnosis was based on presence of typical clinicopathological findings and positive PCR in urine (n=4), blood (n=2), blood and urine (n=5) and seroconversion (n=8). This brings the total number of canine leptospirosis cases to 90 since we started recording in 2017.

Case fatality was 45% (5/11), four dogs were euthanised due to severe anuric renal failure and one dog was euthanised due to financial constraints. Four dogs had been vaccinated with *Leptospira interrogans* serovar Copenhageni (Protech®C2i, Boehringer Ingelheim). One dog had completed a primary vaccination course seven months prior and recovered. One dog had completed a primary vaccination course four and a half years prior but no booster vaccination had been given since then and this dog recovered. One dog had completed a primary vaccination course two months prior and recovered. One dog had received one vaccination 3 years prior however had not completed a primary vaccination course and this dog recovered. All of these previously vaccinated dogs tested positive for serovar Australis on MAT which was assumed to be the infecting serovar.

Microscopic agglutination testing (MAT) was conducted in 10/11 dogs and the results of the highest titres are summarized in the table below.

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Month	AUS	ARB	BAT	BUL	BRA	CAN	COP	CYN	DJA	HAR	ICT	KRE	PAN	POM	Suburb	Outcome
Jan	N/A	<50	N/A	N/A	N/A	<50	N/A	N/A	N/A	<50	N/A	<50	<50	N/A	Jewells	euthanasia
Feb	1600	<50	50	<50	<50	<50	<50	100	50	<50	<50	<50	<50	<50	Albury	recovered
Mar	3200	<50	<50	50	<50	<50	<50	400	200	<50	<50	<50	<50	50	Wollamia	recovered
Mar	1600	<50	50	<50	800	<50	50	<50	<50	<50	<50	<50	<50	400	Browns Mountain	recovered
Apr	800	50	100	<50	N/A	<50	400	400	<50	200	200	50	<50	50	East Kangaloon	euthanasia
Apr	<50	<50	50	<50	<50	<50	100	<50	<50	50	<50	<50	<50	<50	Bellevue Hill	euthanasia
June	1600	<50	<50	50	800	<50	50	200	<50	<50	<50	<50	<50	100	Vincentia	recovered
June	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	Weston	euthanasia
June	3200	200	<50	<50	800	<50	100	50	50	<50	200	50	100	<50	Kangaroo Valley	recovered
Aug	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	Matraville	euthanasia
Sep	<50	<50	<50	<50	200	100	200	<50	<50	<50	50	<50	<50	<50	Bondi Junction	recovered

AUS, Australis; ARB, Arborea; BAT, Batavia; BRA, Bratislava; BUL, Bulgarica; CAN, Canicola; COP, Copenhageni; CYN, Cynopteri; DJA, Djasiman; HAR, Hardjo; ICT, Icterohaemorrhagiae; KRE, Kremastos; PAN, Panama; POM, Pomona; ZAN, Zanoni

Table: Cross reaction may occur with MAT. Titres in bold and highlighted in dark green indicate the serovar we think is responsible based on other cases in the region but confirmation of this is not possible until a serovar specific PCR test is validated. Titres highlighted in light green demonstrate cross reaction with other serovars versus exposure to multiple different serovars.

We recommend vaccination against leptospirosis in dogs living at the South Coast and Newcastle area, in Inner Sydney, Sydney's Eastern suburbs and Inner West or in any area if the dog is in contact with rats or other rodents. Vaccination in other geographic locations with confirmed leptospirosis cases should be considered and discussed with clients however if there is any doubt about the risk of exposure we would recommend to vaccinate. The South Coast has been a major leptospirosis hotspot in 2022 with 27 cases reported to date and serovar Australia was the causative serovar in all cases in which an MAT was performed (Griebsch et al., 2024). While serovar Copenhageni is still the predominant serovar in the Greater Sydney area, serovar Australis has also been found in this region. Our research data has contributed to development of a new bivalent vaccine containing serogroup Australis serovar Bratislava and serogroup Icterohaemorrhagiae serovar Copenhageni (Nobivac Lepto 2, INTERVET AUSTRALIA PTY LIMITED) which is now available in Australia. This vaccine is thought to induce cross protection against serovar Australis. We recommend using this vaccine in all dogs residing in or travelling to the South Coast and in all dogs travelling to Queensland or the Northern Territory in which serovar Australis is the predominant infecting serovar. The new bivalent Nobivac Lepto 2 vaccine should also be considered and offered to all dog owners in the Greater Sydney area and for dogs that have never been vaccinated against leptospirosis and puppies we recommend vaccinating with this vaccine in Greater Sydney. Of note, if switching to the new bivalent vaccine a primary vaccination course (two vaccines given 2-4 weeks apart) is necessary in all dogs even if they have previously been vaccinated against leptospirosis. Therefore, some clients in the Greater Sydney area might prefer to continue with a yearly booster with Protech®C2i from Boehringer Ingelheim containing serovar Copenhageni which has previously been the only registered leptospirosis vaccine for dogs in NSW.

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Interestingly, we did not only find regional differences of infecting serovars but also some differences in clinical presentation. Dogs infected with serovar Copenhageni were significantly more likely to have hepatic involvement with significantly higher liver enzyme activities, bilirubin concentration and icterus whereas dogs with serovar Australis were significantly more likely to have glucosuria (Griebsch et al., 2024).

While there currently seems to be sufficient vaccination supply we have had some vaccination shortages in past years. In the event of a vaccination shortage, for concerned owners unable to complete a primary vaccination course or the annual booster vaccination we recommend providing the following advice to clients:

Risk mitigation methods are the most important measures to prevent leptospirosis. Contact with sources of infection should be limited. This includes limiting swimming or drinking of stagnant water and avoiding contact with possible reservoir hosts such as rodents and farm animals, which can be achieved by fencing and rodent control. Similarly, contact with dogs with leptospirosis should be avoided. In endemic areas – especially during leptospirosis outbreaks – close dog-to-dog contact like doggy day care and boarding in kennels should be reconsidered.

The University of Sydney is continuing to investigate leptospirosis cases to determine the causative serovars and if there is any specific source of infection and risk factors that can be identified. We are also testing dogs who have been in contact with dogs with clinical leptospirosis to assess their risk of infection. Other current ongoing studies include investigating the role of leptospirosis in dogs with PU/PD or CKD and the duration of shedding after commencing antibiotic treatment. Please contact us if you would like more information or if you would like to participate in any of these studies.

Leptospirosis may be suspected in any dog with:

- Nonspecific clinical signs like lethargy, vomiting and diarrhea, which can precede more obvious clinical signs like icterus
- Azotaemia
- +/- hyperbilirubinaemia, elevated liver enzymes
- +/- glucosuria

Important information to ask:

- Is there any contact with rats?
- Is there any contact with stagnant water (eg ponds)?
- Which area is the animal from?
- Has there been any travel into areas in which there have been reported cases (Albion Park, Albury, Annandale, Ashfield, Balmain, Bardia, Bayswood, Bellevue Hill, Bobs Farm, Bondi Junction, Browns Mountain, Burradoo, Cambewarra, Cardiff, Cardiff Heights, Cheltenham, Clovelly, Cooks Hill, Crows Nest, Darlinghurst, East Kangaloon, Elanora Heights, Erskineville, Falls Creek, Figtree, Firefly, Glebe, Gresford, Horsley Park, Huskisson, Ingleside, Jewells, Jervis Bay, Kangaroo Valley, Kembla Grange, Lurnea, Marrickville, Matraville, Medowie, Newcastle, Newtown, Old Erowal Bay, Paddington, Potts Point, Randwick, Rangari, Redfern, Robertson, Sanctuary Point, Speers Point, South Coast, St Georges Basin, Sanctuary Point, Surry Hills, Sussex Inlet, Tomerong, Tuggerah, Trunkey Creek, Vincentia, Wallsend, Waterloo, Weston, Woollamia, Worrowong Heights)?
- Of particular importance are the movements of the dog in the **30 days prior** to developing clinical signs.

In suspicious cases, we recommend the following:

- Collect urine and EDTA blood samples **BEFORE** giving antibiotics – and send to IDEXX or Vetnostics for PCR – if you obtain a positive result, please inform us about the case and request the laboratory ships leftover samples to us after obtaining client consent – these will be useful for further research
- Collect a serum sample – send to IDEXX or Vetnostics for antibody testing (this will help to identify the infecting serovar). If there is a high index of suspicion of leptospirosis but the PCR is negative it is important to perform another titre 2 weeks later to determine whether there has been seroconversion. Similarly, in confirmed cases of leptospirosis a follow up titre will be helpful to determine the causative serovar.
- Ensure appropriate PPE (gloves and gowns) are worn when handling the animal, as leptospirosis is a zoonotic disease.
- Start treatment with IV fluids and antibiotics immediately after collecting diagnostic samples (do not wait for results). Intravenous penicillin derivatives such as ampicillin or amoxicillin are recommended initially, however, these will not clear the organisms from the kidneys. To clear the infection, oral doxycycline (5mg/kg BID or 10mg/kg SID) should be given for 14 days once the patient can tolerate oral medication.
- The animal should be isolated from other animals and only be handled with appropriate PPE. We currently recommend isolation for 72 hours following the commencement of antibiotics. Ideally a urinary catheter should be placed to monitor urine output and avoid contamination of the environment with urine. – **Please consider participating in the “duration of shedding after antibiotic treatment” study if you have a suspicious case. To participate in this study please contact us promptly for further advice.**
- The owner/s should be advised to seek medical advice.

We kindly ask that you report any suspicious cases to the UVTHS and request you obtain and store **serum, EDTA and urine samples** if you can for us (please separate serum, use small urine tubes if possible and freeze samples if stored for >1 week – if storage time is less, we can collect the samples or organise a courier). If you have a high index of suspicion for leptospirosis however the client is financially constrained, please contact us and send us the history and blood results for the patient. We have a small amount of research funds available to cover costs for leptospirosis testing in those cases.

In-contact dogs should also be treated with a 14-day course of doxycycline. **If possible and after obtaining client consent please collect whole (EDTA) blood, urine and serum from these in contact dogs before starting doxycycline.** This will help us to assess if in-contact dogs are infected without having clinical signs (silent shedders) or have been exposed to leptospirosis without being infected. Please contact us and we will provide you with an appropriate submission form. We will cover the costs for testing in contact dogs and will inform you of the results.

If you have any suspicious cases, have samples to collect, or want to discuss a case, please contact:

Dr Christine Griebisch Dr med vet DipECVIM-CA (Small Animal)
EBVS® European Veterinary Specialist in Small Animal Internal Medicine
Senior Lecturer in Small Animal Medicine

Sydney School of Veterinary Science
University Veterinary Teaching Hospital Sydney
65 Parramatta Road, 2050 Camperdown NSW
AUSTRALIA
email: christine.griebsch@sydney.edu.au
T +61 2 9351 3437, F +61 2 9351 7436
Mobile: 0405 969008

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