Renal Failure in Macropods

Definition

- Renal failure - when the kidneys cannot perform their normal functions, viz: excreting waste (eg urea and creatinine), balancing electrolyte levels (eg sodium and potassium), controlling body fluid, blood pressure, acid balance, red blood cell and vitamin D production

- Renal failure can be acute (often reversible) or chronic.

Causes of acute renal failure

Can include:

- Dehydration eg. Prolonged strenuous exertion on a hot day
- Hypovolemia eg. haemorrhage
- Rhabdomyolysis eg. exertional
- Medication eg. NSAIDS
- Crystalluria blocks urine output

Chronic renal failure

- Cause often not obvious
- Usually irreversible
- May result from: Rhabdomyolysis, Crystal nephropathy, Babesia.

Symptoms

- Acute renal failure – macropod passes little (highly concentrated) or no urine
- Chronic renal failure – poor weight gain, lethargy, polydipsia, polyuria (often wet bags).

Consequences

- Level of waste products increase in blood (urea, creatinine)
- Anorexia
- Lethargy
- Hyperkalemia
- Metabolic acidosis
- Death

Diagnosis

- Urine analysis
- Low specific gravity (dilute urine) combined with high urea on blood test
- Presence of protein and red blood cells in urine. Kidneys start to leak protein
- Confirm with blood test for urea, creatinine.

Rudi

- Chased by dogs on hot day
- Not given intensive fluid therapy for exertional rhabdomyolysis and to treat dehydration and prevent chronic renal failure caused by myoglobin
- Very unwell for a number of weeks after incident. Appeared depressed, lethargic with poor appetite and weight loss ? Renal failure? Dorsal Vagal ‘shutdown’.

India

- Sustained an eye injury in release enclosure during a severe storm which brought down a pine tree.
- Treated with gentamicin for eye injury but not given fluids to treat the exertional rhabdomyolysis
- Developed renal failure. Note elevated urea, creatinine and potassium

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Parameter	Result	Std value*
Urea	164	8.6 mmol/L
Creatinine	1425	133 umol/L
Potassium	7.3	4.2 mmol/L

Pino

- Came from another carer
- Found after release unwell with fox attack injuries to the head. No intensive fluid treatment was given for exertional rhabdomyolysis
- Consecutive blood test results indicated progression in her renal failure.

Parameter	Result 10/ 08/ 09	Result 05/ 09/ 09	Std Value*
Urea	38	56	8.6 mmol/L
Creatinine	330	520	133 umol/L
Potassium	5.8	4.9	4.2 mmol/L
Hb	99	79	

Ned, Bob, Lenny, Tulley, Flynn

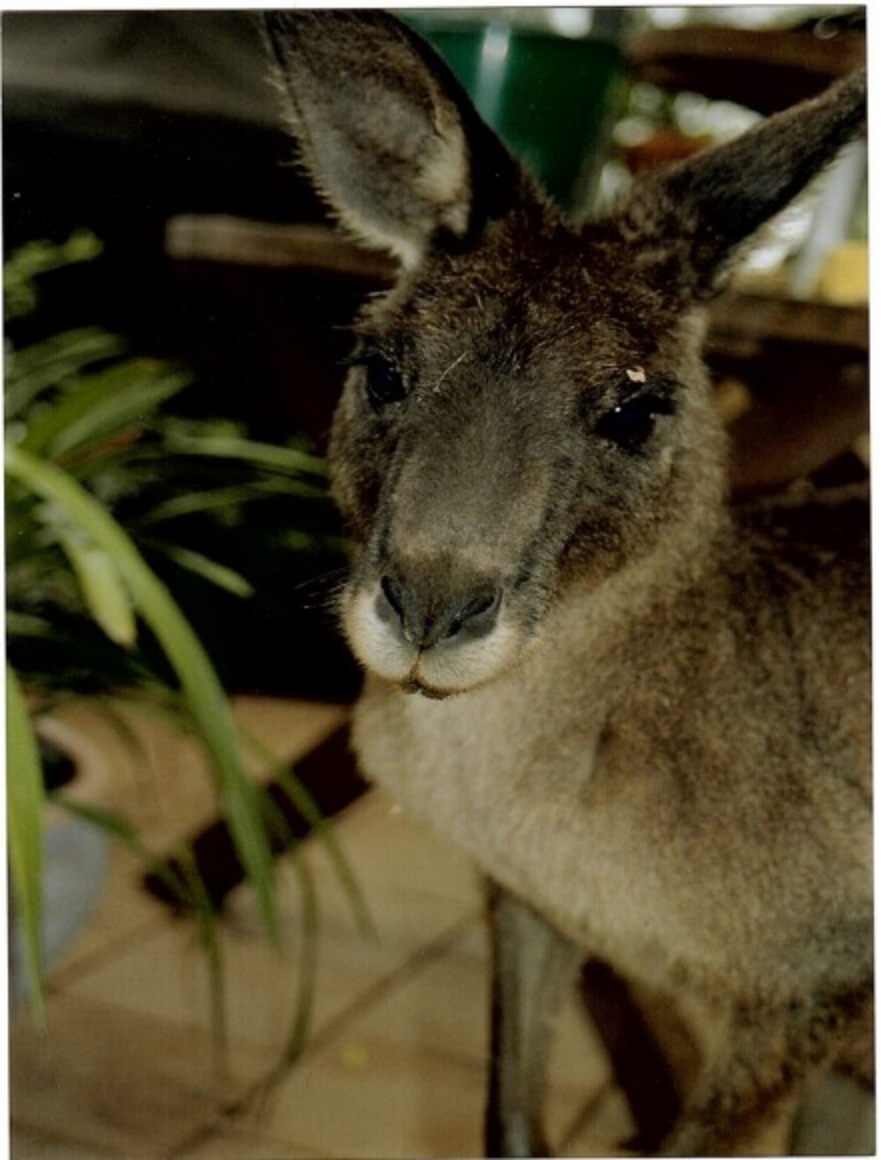
- About 18 years ago four released kangaroos died from what appeared to be renal failure
- **Ned** was unwell for a long period. He lost weight, fur was unkempt and became very dark. He was euthanased
- **Bob** had similar symptoms and had a cardiac arrest in the veterinary surgery
- **Lenny** showed lethargy, weight loss, ‘aeroplane’ ears. Blood tests showed renal failure.

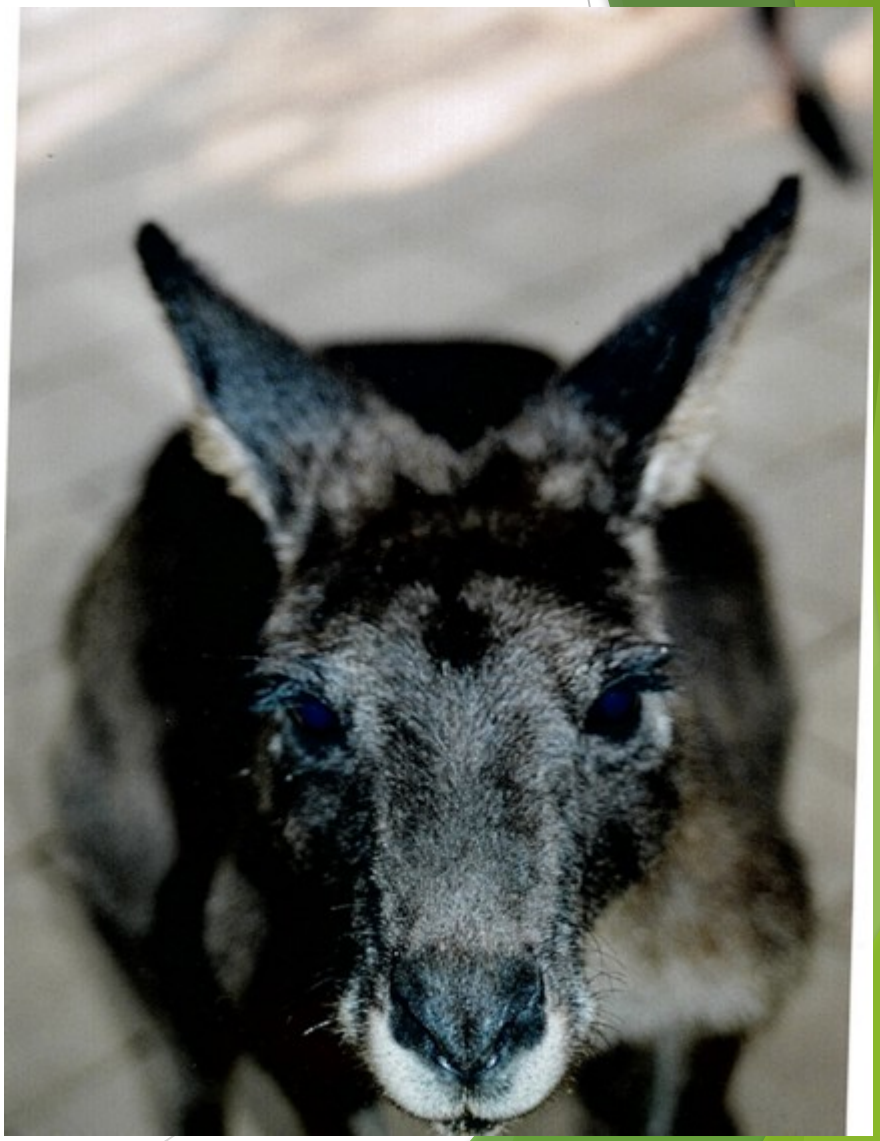
Ned, Bob, Lenny, Tulley, Flynn (Cont)

- **Tulley** - weight loss, lethargy. Euthanased after having a seizure. Post-mortem histopathology indicated chronic kidney disease

- **Flynn** – weight loss, lethargy. Treated with Imidocarb (recommended treatment for Babesia). Flynn made a full recovery.

Ned





Ned & Billy

Flynn & Tulley

Babesia

- Has been identified in kangaroos on the east coast of Australia
- Babesia can cause renal failure
- First case of Babesiosis in a human reported in 2012 in a patient from the south coast at The Canberra Hospital
- Ticks are known vectors but are not common in Canberra/ Southern Tablelands area

Crystalluria

- Macropod joeys need to be well hydrated otherwise they are at risk of developing crystals in the urine which can cause acute urine retention
- A consequence can be acute renal failure and possible irreversible damage to the kidneys
- Crystal nephropathy could cause chronic renal failure in kangaroos.

Exertional Rhabdomyolysis

- An important and common problem in macropods and is often unrecognised initially

- It is important if exertional rhabdomyolysis is suspected to give intensive fluid treatment. Any macropod subject to a stressful event should have a urine analysis done to check for myoglobin. The myoglobin causes a positive haemolysed red blood result on the dipstick

Summary

- Important to recognise that acute renal failure can occur in certain situations such as severe dehydration and crystalluria so appropriate treatment can be given early
- Consider renal failure in macropod joeys with failure to thrive and bag wetting and in larger macropod with lethargy, weight loss and increased water consumption
- Any macropod with exertional rhabdomyolysis needs intensive fluid therapy to prevent the toxic effect of myoglobin on the kidneys and consequent chronic renal failure
- Knowledge about renal failure in macropods is limited and mostly anecdotal.