Renal Failure in Eastern Grey Kangaroos

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, and red blood cell production

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

Causes of acute renal failure

Can include:

- Dehydration
- Hypovolemia
- Rhabdomyolysis
- Medication
- Severe infection
- Crystalluria.

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
- Heart failure.

Diagnosis

- Urine analysis
- Low specific gravity (dilute urine)
- Presence of protein and red blood cells
- Confirm with blood test for urea, creatinine and creatine kinase (indicator of myonecrosis).

Rudi

- Chased by dogs on hot day
- Not treated aggressively for myopathy or to prevent renal failure
- Very unwell for a number of weeks after incident most likely due to renal failure and was euthanased.

India

- Eye injury in release enclosure
- Treated with gentamicin for injury but not treated aggressively for myopathy
- Developed renal failure. Note elevated urea, creatinine and potassium
- Note elevated CK indicative of myonecrosis.

Parameter	Result	Std value*
Urea	164	8.6 mmol/L
Creatinine	1425	133 umol/L
Potassium	7.3	4.2 mmol/L
CK	13399	747 U/L

Pino

- Came from another carer
- Found after release unwell with fox attack injuries to the head
- 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
CK	1223	8815	747 U/L
Hb	99	79	154 g/L

Ned, Bob, Lenny, Tulley, Flynn

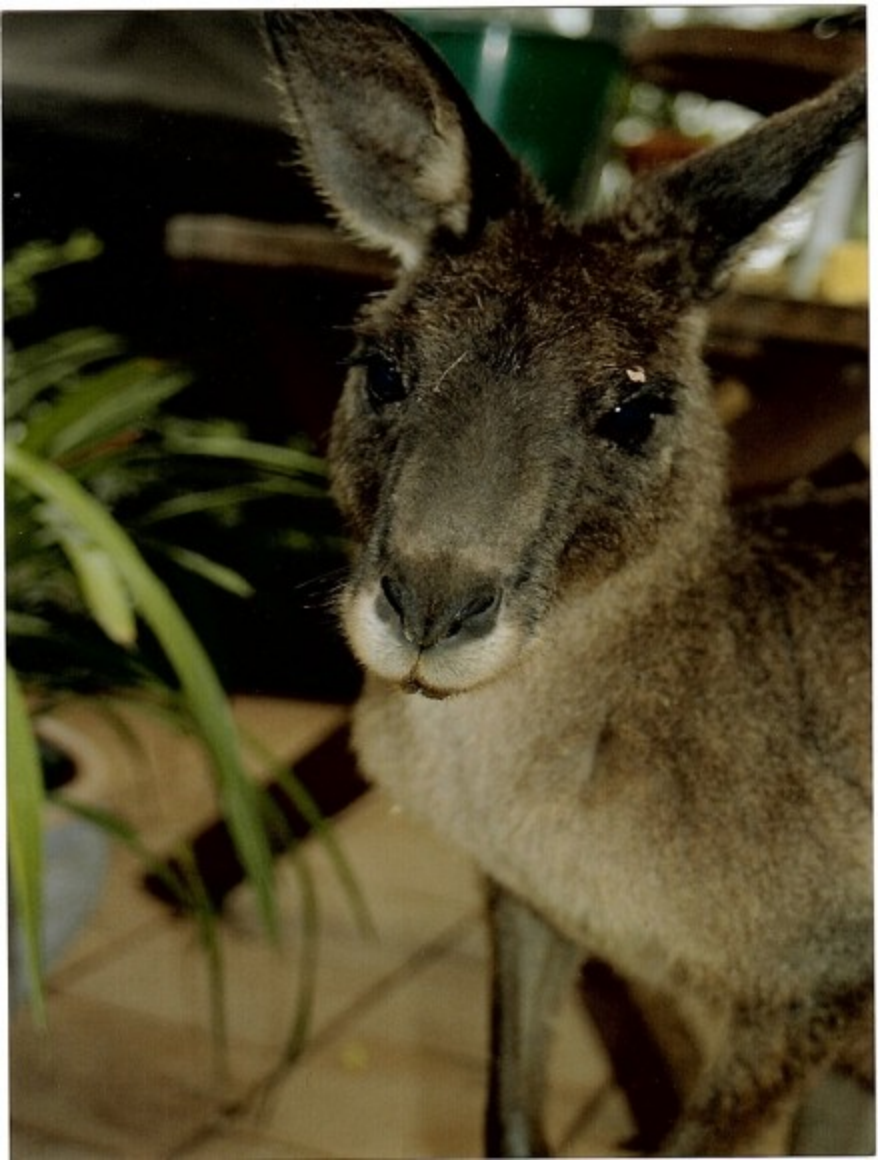
- Fifteen years ago four released kangaroos died from what appeared to be renal failure
- **Ned** was unwell for a long period. He lost weight, fur was unkempt and became very dark. He was euthanased
- **Bob** had similar symptoms and had a cardiac arrest in the veterinary surgery
- **Lenny** showed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

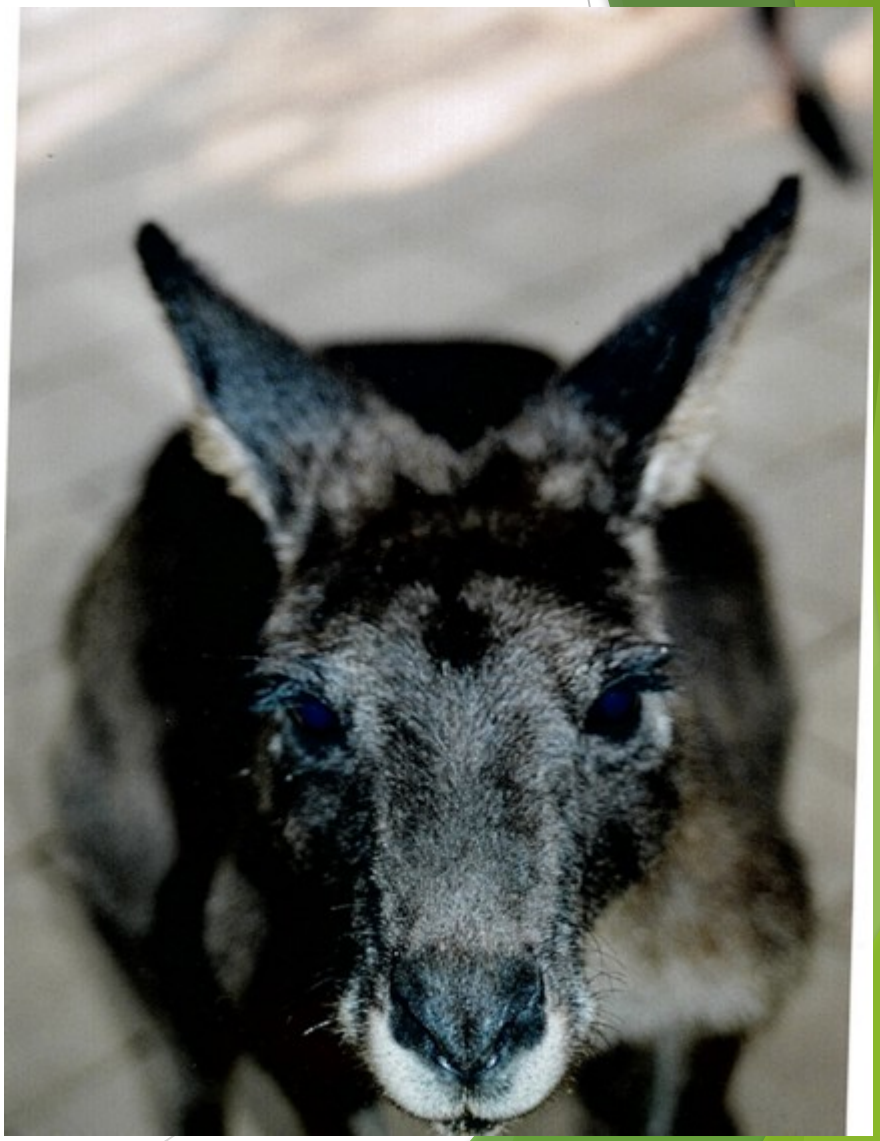
Ned, Bob, Lenny, Tulley, Flynn (Cont)

- **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 EG kangaroos on east coast of Australia
- Babesia can cause renal failure
- First case of Babesiosis in a human reported in 2012 in a patient at The Canberra Hospital
- Ticks are known vectors but are not common in Canberra/ Southern Tablelands area
- The kangaroo flat fly is a possible vector.

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 EG.

Myopathy

- An important and common problem in EG and is often unrecognised initially
- Is important if myopathy is suspected to treat aggressively with fluids. Any macropod subject to a stressful event should have a urine analysis done.

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 EG joeys with failure to thrive and bag wetting and in larger EG with lethargy, weight loss and increased water consumption
- Any EG with myopathy needs intensive fluid therapy to prevent the toxic effect of myoglobin on the kidneys and consequent renal failure
- Knowledge about renal failure in EG is limited and mostly anecdotal.