



Photos: Rachel Westcott

Species

Phascolarctos cinereus

The Koala is an arboreal, mostly nocturnal marsupial. They are monogastric hindgut fermenters and feed almost exclusively on certain species of eucalypts. Populations maintain a local dominance hierarchy: individuals are not territorial per se, & can live for 13-18 years. Mature males have a sternal scent gland. Koalas in SA and VIC are larger than those in NSW and QLD.

Admission and Handling

In **South Australia**, Veterinarians can assess, admit and treat Koalas. Wildlife carers **MUST** hold a permit issued by Dept of Environment, Water & Natural Resources (DEWNR) to enable them to care for koalas.

Complete SAVEM's *Wildlife Admission Form*. Koalas are strong animals with sharp claws and a powerful bite. They may 'roar' when threatened or restrained. All handling should be carried out as quickly and quietly as possible. A variety of holding techniques are available, depending on confidence of the handler and demeanour of the koala. The minimal degree of restraint to achieve what is required should ideally be employed. For inexperienced handlers, a thick blanket may aid in safe restraint to facilitate sedation or anaesthesia.

Anesthesia & Sedation

Isoflurane by mask can be used to anaesthetise most koalas in most situations, though the physical restraint required may be problematic in agitated or injured koalas, necessitating injectable sedation/induction. Intubation can be difficult and unnecessary for short procedures. (See table below for formulary).

Weight (kg)	Mean	Range
Females	8.5	7 – 11
Males	12	9.5 – 14.9

Examination

Observe **demeanour** and **gait**. Koalas normally have a high stepping fore and hind limb gait when on the ground. A thorough examination requires anaesthesia.

Resting HR 65-90 bpm

Resp Rate 10-15 bpm

Both may be elevated if agitated.

Core temp 35.5—36.5°C

Body Condition: best determined by the muscle mass over the scapulae.

Hydration: assess the ease of skin movement over the scapulae; skin tenting can be misleading

Dentition (3/1 1/0 1/1 4/4): the degree of tooth wear will influence prognosis, regardless of the problem diagnosed. Advanced tooth wear can cause debility in an otherwise healthy individual. Dental charts to aid ageing koalas are available on request.

Eyes: should be clear

Cloaca: should be clean

Pouch: check for pouch young in females, especially if the animal is to be euthanased.

Clinical Pathology

Blood: cephalic, femoral, jugular veins. Reference values available are (PCV 29 – 44, TP 58 – 83)

Urinalysis: dipstick, sediment & USG examination recommended.

Right: "bow tie" and spicules of oxalate crystals typically found in cases of oxalate nephrosis (see below).

Photo: Dr Natasha Speight, Adelaide University



Nutrition

Adult koalas should be **offered 5kg fresh eucalypt daily, ideally 3 different species** to provide choice (see below).

Dependent joeys should be bottle fed an appropriate milk replacer (eg Wombaroo Koala Milk Replacer, Biolac, Di-Vetelact) according to label instructions.

Offer a water bowl to koalas in hospital; they will drink if they need to. Beyond initial rehydration, a drinking koala often has a poor prognosis in SA.

Common Presenting Problems

Trauma - Dog attack or Motor vehicle injury – very common; full body radiographs indicated as multiple injuries are common: fractures, spinal injury, haemorrhage etc.

Oxalate Nephrosis - Important disease very common in mainland SA koalas – oxalate crystals in urine (fine spicules, often radiating), dehydration, azotemia, chronic fibrosing nephritis. A diagnosis of oxalate nephrosis is generally considered incompatible with rehabilitation & release.

Burns - Especially in association with bush fires – treat intensively using standard techniques for other species; euthanasia may be indicated if greater than 10% body surface area.

Emaciation - Variably due to advanced tooth wear, poor food supply (drought, bushfire, overpopulation etc) or chronic disease.

Chlamydiosis - Conjunctivitis and urogenital disease due to *Chlamydophila pneumoniae* or *C. pecorum*; carries a poor long-term prognosis. A nationally significant disease common in the eastern states, recently diagnosed in Adelaide Hills. If suspected contact SAVEM for assistance.

Cryptococcosis - *Cryptococcus gatti* (association with river red gums), *C. neoformans* causing granulomatous disease in the respiratory, central nervous and/or other systems.

Neoplasia - Lymphoid neoplasia – likely association with koala retrovirus (common in QLD and NSW; unknown prevalence in SA)



Premolars worn to level of hard palate. Photo: Rachel Westcott

SA Eucalypts suitable for browse

E. camaldulensis (River Red Gum)
E. globulus spp (Bluegums)
E. ovata (Swamp Gum)
E. cosmophylla (Cup Gum)
E. viminalis (Manna Gum)
E. baxteri (Brown Stringybark)
E. obliqua (Messmate Stringybark)

Housing in Hospital

Basic principles of first aid in other species can be applied to koalas. Appropriate husbandry and nutrition is critical to achieving a successful outcome. Koalas are best housed individually away from other species. In the absence of upright tree trunks, koalas can hold on to pillows, rolled up towels or large soft toys. Provide browse of appropriate species of eucalypt. Stand this in water, or hang from above to prevent soiling, and spray with water to assist with hydration.

Treatment

Fluid Therapy: koalas can easily be over-hydrated, & have a low metabolic rate.

Oral via syringe, bottle (especially dependent joeys), spraying browse, water bowl

Subcutaneous is difficult in large volumes due to low S/C space

Intravenous via indwelling cephalic or saphenous catheter

Drug Therapy: there are no drugs licensed for use in koalas. There has been limited pharmacokinetic research in koalas. Antibiotics can disrupt GI flora, especially with oral administration. Adverse reactions reported with tetracyclines and erythromycin.

Available evidence suggests poor efficacy with oral drugs in koalas.

DRUGS	Dose (mg/kg)	Route
Trimethoprim-sulfadiazine	30 (combined)	PO, bid
	17	SC, bid
Amoxicillin/Clavulanic Acid	12.5	SC/IM/PO bid
Enrofloxacin (AVOID unless indicated by C&S)	6	IV sid – bid
	10	PO, bid
Meloxicam	0.1 – 0.2 for 3-5/7	SC, IM, PO sid
Codeine	0.5	PO
Butorphanol	0.2	IM, IV
Diazepam	0.5 - 1.0	IM
Tiletamine/Zolazepam	5 - 10	IM
Alphaxalone	1- 2, IM & IV respectively	
Multivitamin	Label dose for small animals	

When is euthanasia indicated?

This is a clinical decision, but may include:

- * Dental disease - gum retraction or root exposure in premolars
- * Multiple fractures, other trauma or any condition likely to prevent successful rehabilitation.
- * Renal failure
- * Chlamydiosis
- * Burns greater than 10% of the body

REFERENCES

- Blanshard B. and Bodley K.** 2008. Koalas. In: Medicine of Australian Mammals. Eds: Vogelneust L. and Woods R. CSIRO. Pp 227 – 328.
- Holz P.** 2007. Marsupials. In: Zoo Animal and Wildlife Immobilization and Anaesthesia, Eds: West G., Head D. and Caulkett N. Blackwell Publishing. pp 341 – 346.
- Post Graduate Foundation** in Veterinary Science. 1999. Wildlife in Australia: Healthcare and Management. Proceedings 327. University of Sydney.
- Fowler, A.** Course Notes for *Treating Burns*, CVE TimeOnline 2012, & SAVEM 2012
- ZoosVictoria**, Notes for Veterinarians treating Koalas in Hospital 2009

Acknowledgements: SAVEM thanks Drs David McLelland, Lynley Johnson, Anne Fowler, Ian Hough, Oliver Funnell & David Mason and Ms Heather Lyman for their generous assistance in the preparation of this document.

This Treatment Sheet (First Edition April 2013) has been compiled & published by SAVEM. It is intended to assist veterinarians in the assessment and treatment of injured & ill Koalas. For further assistance or to obtain Reference material please visit www.savem.org.au