

Natural History / Behaviour

- Marsupials – always check for pouch young
- Nocturnal but may move trees through the day to avoid birds, other koalas or to find a cooler location when hot
- Have powerful teeth and claws – can be aggressive particularly after being attacked by a dog
- Koalas have a very specialised diet; they only eat eucalypt (no artificial diet)
- Koalas require a specialised Rehabilitation Permit to keep
- Orphaned koalas require highly-specialised care – they must be referred to an experienced/licensed koala carer immediately
- Unfurred joeys require regular feeding (every 2-3 hours)

Common Species of South-east Queensland

Koala

Phascolarctos cinereus

4.5 kg – 9 kg (average, Queensland adult weight)

Basic Rescue Equipment and Emergency Housing

Adults / Sub-Adults

- Large wire mesh cage (top-opening)
- Towels and/or small blankets to line bottom of cage
- Make-shift tree branch – wrap 2 towels folded in half lengthways and roll around a ~45cm section of foam pool noodle. Secure with a bungee cord to side of cage.
- Thick blanket to capture and handling
- **Beware of overheating a koala** - with overly active koalas or on high ambient temperature days, minimise bedding and avoid obstructing airflow into and out of the cage (reduce cage coverage).

Orphaned Joeys

- Warm outer pouch (feather pouch, thick wool or cotton pouch)
- Inner pouches (liners) x 3 (lined within themselves)
- Plastic carry basket lined with towels or small cotton baby blankets
- Heat source: Hot water bottle, instant heat packs, Snugglesafe, electric heat pad or ICU
- Probe thermometer to monitor ambient pouch temperature
- Clean teddy bear to give them something to cling onto (appropriate to the size of the joey)



Photos: Karen Scott and AZWH

OHS Considerations / Zoonoses

Beware of

- Teeth
- Claws (both forearms and hind limbs)

Known Zoonotic Diseases

- Chlamydia – very low to nil risk of infection from koala to humans if good hygiene is initiated (2 strains known to infect koalas, only one (*C. pneumoniae*) potentially transferable to humans)
- No other known specific zoonoses.

Handling

Adults

Cover the koala with the blanket and grip the koala's forearms (between the shoulder and elbow) through the blanket ensuring that the head remains covered. Roll your hands outwards to create protection with the blanket so it bites that instead of you.

Never pick up around the ribs.

Very sick/weak adults can be handled by firstly wrapping a blanket around them, and then placing one hand under their arms and across their chest and the other under their rump.



Photos: AZWH

Orphans

Small joeys can be cupped in your hand and placed into a pouch. Keep joeys in a pouch at all times.

Older joeys can be handled by placing one hand across their thoracic region and the other under their rump. Some juveniles can be aggressive, in which case handle as per adult.

Photos: Lee Pirini (left) and AWZH (right)



Assessment Checklist – Koalas

Clinical Signs	Healthy / Normal	Sick / Injured
Demeanour	<ul style="list-style-type: none"> Bright, alert and looking around Responsive (struggles strongly when handling) Responsive to stimuli (e.g. noises) Conscious Vocalises aggressively (adults) Crying (orphans) Tries to bite, scratch and kick 	<ul style="list-style-type: none"> Quiet / depressed Distressed Reduced response when disturbed – returns to 'sleeping' shortly after disturbance Not responding to stimuli Unconscious Teeth grinding (<i>pain/stress</i>) <i>(Indicative of shock, dehydration, injury)</i>
Mobility	<ul style="list-style-type: none"> Able to move all limbs No bruising or swelling No obvious abnormalities or lack of symmetry Can climb easily 	<ul style="list-style-type: none"> Abnormalities in movement (e.g. only using front legs, dragging a limb, falling over, swaying) Swelling/distortion (<i>trauma, cancer</i>) Head tilted to one side (<i>head injury</i>) Paralysis (<i>trauma</i>) <i>(Indicative of trauma related injury)</i>
Limbs, Digits and Claws	<ul style="list-style-type: none"> All limbs, digits and claws present and in good condition 	<ul style="list-style-type: none"> Swelling or lacerations Lack of movement Missing limb(s) all or part (<i>injury</i>) Missing one or more digits or claws (<i>injury</i>) Torn/ripped nails (<i>trauma – generally vehicle or dog</i>)
Body Condition	<ul style="list-style-type: none"> Good body condition Good muscle tone over shoulders Fur in good condition Non-odorous smell 	<ul style="list-style-type: none"> Open wounds Puncture wounds Poor body condition – bony prominences apparent (<i>malnourished</i>) Depressions in the front area (temporal muscles) of the head (<i>malnourished</i>) Lack of muscle tone over shoulders and limbs Reduced abdominal "fill" Offensive odour (<i>chronic disease or old wounds</i>) Missing fur (<i>trauma</i>) Bruising (<i>trauma</i>) Flaky, dry skin (<i>chronic illness</i>) <i>(Indicative of trauma or chronic illness/disease)</i>
Breathing	<ul style="list-style-type: none"> Normal (handling may result in increased respiration rate) Inaudible 	<ul style="list-style-type: none"> Open-mouthed breathing Laboured (noticeable effort to breath) Audible breathing sounds (clicking, ticking, gurgling sounds) Sneezing or coughing Shaking head (<i>possible obstruction or head injury</i>) <i>(Indicative of trauma related injury, poisoning)</i>
Head	<ul style="list-style-type: none"> Symmetrical 	<ul style="list-style-type: none"> Abnormal symmetry Indentations Swelling Crepitation Lacerations/abrasions <i>(Indicative of trauma related injury)</i>

Assessment Checklist – Koalas (continued)

Clinical Signs	Healthy / Normal	Sick / Injured
Nose	<ul style="list-style-type: none"> • Straight • No discharge or bleeding 	<ul style="list-style-type: none"> • Distorted (<i>trauma - fracture</i>) • Blood or other discharge (purulent infection) from nostrils (<i>trauma</i>) • Abrasions (<i>trauma</i>) • Swelling (<i>trauma</i>)
Eyes	<ul style="list-style-type: none"> • Bright and clear • Shiny • Pupils may be unreactive to light in anxious or stressed animals. PLR unreliable. 	<ul style="list-style-type: none"> • Dull (<i>pain/dehydration</i>) • Sunken (<i>dehydrated</i>) • Closed (<i>pain/dehydration</i>) • Protrusion (<i>trauma</i>) • Swelling (<i>trauma or infection</i>) • Clear fluid (<i>trauma or infection</i>) • Nystagmus (<i>head trauma</i>) • Unequal pupil(s) (<i>trauma</i>) • Unreactive pupil(s) (<i>trauma</i>) • Purulent discharge (<i>infection</i>)
Mouth	<ul style="list-style-type: none"> • No discharge • Symmetrical • Teeth and tongue undamaged • Mucous membranes light pink 	<ul style="list-style-type: none"> • Mal-aligned jaw (<i>trauma</i>) • Broken teeth (<i>trauma</i>) • Tongue protruding (<i>trauma</i>) • Blood (<i>trauma</i>) • Swelling (<i>trauma</i>) • Crepitation (<i>trauma</i>) • Pale or blue mucous membrane (<i>shock/dehydration/blood loss</i>) • Slow capillary refill time (<i>shock/dehydration</i>) • Cold (<i>shock</i>)
Ears	<ul style="list-style-type: none"> • No discharge 	<ul style="list-style-type: none"> • Blood • Clear fluid <p>(Indicative of trauma related injury)</p>
Fur	<ul style="list-style-type: none"> • Shiny and in good condition • Well groomed • Non-odorous 	<ul style="list-style-type: none"> • Offensive odour (<i>old injury, disease</i>) • Dull, matted fur (<i>chronic condition</i>) • Dry, brittle, excessively brown (<i>disease</i>) • Patchy or missing fur (<i>dog/cat attack or disease</i>) • Wet patches of fur (<i>dog attack</i>) • Saliva smell (<i>dog attack</i>) • Fungal infections (<i>chronic illness</i>)
Cloaca (vent) Pouch / Scrotum	<ul style="list-style-type: none"> • Clean • Free from discharge • Penis not protruding 	<ul style="list-style-type: none"> • Blood (<i>trauma</i>) • Lacerations (<i>trauma</i>) • Swelling (<i>trauma</i>) • Pouch – check for joeys • Penis – protruding (<i>trauma</i>) • Urine staining, wet or blackened rump (<i>disease</i>) <p>(Indicative of trauma related injury)</p>
Parasites	<ul style="list-style-type: none"> • Some ticks are normal and are usually of no concern 	<ul style="list-style-type: none"> • Overabundance of ticks (<i>chronic illness</i>) • Fly blown/Maggots (<i>trauma</i>)

Assessment Parameters

Vital Signs

Heart Rate	65 - 90 beats per minute
Respiration Rate	10 - 15 breaths per minute
Core Body Temperature	35.5°C – 36.5°C

Preferred Ambient Temperature

Adults and Sub-Adults	28°C
Orphans – Just furred to furred	28°C - 30°C
Orphans – Unfurred	32°C - 34°C

Signs of Stress

- Vocalisation
- Flinching
- Attempting to escape
- Panting/noticeable breathing
- Aggressive behaviour
- Defensive stance – upright, forelimbs in air

Signs of Pain

- Teeth grinding
- Ear flicking
- Aggressive behaviour
- Laying in lateral or dorsal recumbency
- Sweaty palms
- Reduced level of alertness
- Closed eyes
- Heavy breathing
- Repetitive behaviour
- Head down between legs

Signs of Dehydration

- Dry tacky mucous membranes
- Dull eyes
- Sunken eyes
- Lack of skin elasticity
- Lethargy

Sign of Over-heating

- Panting/noticeable breathing

Assessment of Body Condition

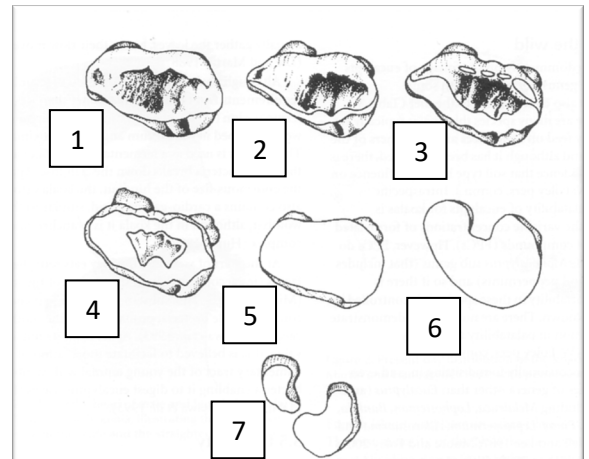
Scapula (shoulder blade) and spine – feel for good muscle coverage.
Fur – uniform thick fur, no missing fur, bottom should be clean (not brown and/or wet), overall fur colour should be grey, not brown/yellow.

Diagram Right

The Characteristic wear patterns on a premolar from the upper jaw of a koala.

- 1) 1 to 2 years (no wear)
- 2) 2 to 4 years (one line of wear – buccal side of tooth)
- 3) 4 to 6 years (one full line and part or a full second line)
- 4) 6 to 10 years (full ring of wear – extends with age)
- 5) 10 to 12 years (full wear almost to the gum line)
- 6) 12 + years (wear exposing base of tooth)
- 7) 15 + years (wear leading to loss of all mastication surface)

Diagram reproduced and adapted from 'The Koala: Natural History conservation and management' by Roger Martin and Kathrine Handasyde with permission of UNSW Press.



Common Injuries, Diseases and Conditions

Adults

- **Road trauma injuries** (head injury, fractured jaw, limbs, spine, pelvis, internal injuries, lacerated tongue)
- **Dog attack** (puncture wounds, evisceration, internal injuries)
- **Chlamydia** (inflamed/infected eyes, stained brown wet bottom, nasal discharge)
- **Other Disease** (thin, weak, poor body condition, dehydrated)



Orphans

- **Dehydration** – (level dependent upon length of time without maternal nutrition)
- **Fractures** (from road trauma or dog attack)
- **Hypothermia** (particularly unfurred joeys and in colder months)
- **Hypoglycaemia (low blood sugar level)** (weakness, lethargy)
- **Dog attack** (puncture wounds, internal bleeding, fractured limbs)
- **Chlamydia** – (inflamed/infected eyes, stained brown wet bottom, nasal discharge)



Photos Above: Injuries from dog attacks are often not discernible. Any evidence of bites (i.e. saliva on the fur) – assume significant injury and treat aggressively. Any bites around the abdomen require transfer to a wildlife hospital urgently as most suffer extensive internal injuries and require an exploratory laparotomy. *Photos: AZWH*

Photos Far Right:
Conjunctivitis form of Chlamydia

Photo Right:
Cystitis – urogenital form of Chlamydia

Photos: AZWH



Emergency Diet

Do not offer any food or water to an animal suffering from injury (e.g. vehicle hit, dog/cat encounter etc). Injured wildlife must be presented to a veterinarian for treatment before offering food or water. Alternatively, please consult with your relevant Species Coordinator.

Adults

- **Fresh eucalypt leaf on the stem** – only certain species of eucalypt eaten (refer to experienced koala rescuer/carer)

Koalas being held for more than ~1 hour in a holding cage pending assessment, should be provided with fresh eucalypt leaf (provided they have no critical injuries). Providing fresh gum leaf significantly reduces stress.

Note: No supplementary/artificial diets to be provided to koalas.

Orphans

- **Water and Glucodin** (initially for first feed); then
- **Suitable milk replacer** (Divetelact®, Biolac M100® or M150®) or Wombaroo® Koala Milk Replacer)
- **Fresh eucalypt leaf** – only certain species of eucalypt eaten (refer to experienced koala rescuer/carer) - furred joeys only
- **Feeds require use of glass syringe. Koala joeys have high risk of aspiration: hence, need for specialised koala carer.**

Drug Administration (preferred routes)

Oral	Adults:	Use a 2.5mL syringe
	Orphans:	Use a small possum teat with a glass syringe Note: Feeding orphaned koala joeys is a specialised technique – refer to a licensed koala carer immediately.
Intramuscular	Cranial thigh, dorsal lumbar muscles	
Subcutaneous	Loose skin at lateral neck/shoulders.	
Intravenous	Cephalic vein or saphenous vein.	

Euthanasia (preferred methods)

Euthanasia methods stated to assist veterinary staff.

Wildlife volunteers must not euthanise unless trained to do so or they hold appropriate approvals.

- Injection of sodium pentobarbitone (Lethabarb) after induction with Isoflurane (strongly preferred):
 - Intravenous
 - Intracardiac (must be anaesthetised first)
 - Intraperitoneal (dilute with water 50:50)
- Blunt force trauma to the head (small unfurred joeys only) – **only if trained to do so**

Suggested Drugs and Dose Rates

This information is provided for **VETERINARY USE ONLY** to assist veterinary staff with the **initial assessment** and **emergency treatment** of sick, injured and orphaned wildlife. Suggested drugs and doses are those commonly used by the wildlife hospitals in South-east Queensland and are for routine treatment only. Recommendations may vary between individual veterinarians. Culture and sensitivity results would indicate the most appropriate antibiotic regime. Most drugs are used off-label. Most drugs are used off-label.

For more information see 'Current Therapy in Medicine of Australian Mammals' by Vogelneust and Portas (2019).

Anaesthetic

Drug	Composition	Dose Rates
Isoflurane ®	Isoflurane 100%	5% for induction and 2-3% for maintenance with oxygen flow rate of 1-2 litres per minute
Alfaxan CD RTU ®	Alphaxalone 10mg/mL	3-5mg/kg (IM) or 0.5-1.0mg (IV)
Pamlin ®	Diazepam 5mg/mL	0.2–1mg/kg Q4h (IV or IM) for light sedation/seizure control

Analgesic

Drug	Composition	Dose Rates
Methone ®	Methadone hydrochloride 10mg/mL	0.15 - 0.5 mg/kg - 4 to 6 hourly (SC)
Temgesic ®	Buprenorphine hydrochloride 0.3mg/mL	0.01mg/kg - 8 to 12 hourly (SC)
Fentanyl ®	Fentanyl 500mg/10mL	0.5-3ug/kg/hr (10mLs Fentanyl and 10mLs NaCl into 20mL syringe delivered by slow infusion). Start at 1-2µg/kg/hr and adjust accordingly
Rimadyl ®	Carprofen	Day 1 - 4mg/kg SID (SC or IM) Days 2 – 5 - 2mg/kg SID (SC or IM)
Metacam ®	Meloxicam	Day 1 - 0.2mg/kg SID (IM or SC) Days 2 – 5 - 0.1mg/kg SID (IM or SC)
Painstop ®	Paracetamol 24mg/mL Codeine 1mg/mL	15mg/kg of Paracetamol component 8 hourly (PO)
Infant Panadol Drops ® (1 month to 2 years)	Paracetamol	15mg/kg - 4-6 hourly (PO)

Antibiotics

Drug	Composition	Dose Rates
Clavulox® Injectable	Clavulanic acid 35mg/mL Amoxycillin 140mg/mL	10-15mg/kg combined drugs SID for 5 days (IM)
Fortum ®	Fortum pentahydrate 1g	20mg/kg (IV) TID for 5-7days
Trivetrim ®	Trimethoprim and Sulfamethoxazole	25mg/kg SID (IM) initial dose then Septrin®/Bactrim® oral
Septrin ® / Bactrim ®	Trimethoprim and Sulfamethoxazole Suspension	3 to 5 mg/kg of Trimethoprim component BID (PO) – Joeys only.



Left: Koala skeleton

Source: Wikipedia

Below: Visceral anatomy of the koala

Source: Koalas, the little Australians we'd all hate to lose - Bill Phillips AGPS)

