



Commonly seen problems during anaesthetic stages in rabbit patients.

Anaesthetic stage	Problems	Signs	Main causes	Corrective strategies
Pre-anaesthesia (in all cases patients should be stabilised and fully assessed for suitability prior to anaesthetising)	Anorexia and hypoglycaemia	Poor body condition, no gut sounds in rabbits and rodents, weakness/lethargy, ataxia	Lack of suitable diet, pain/discomfort, disease, stress	Supportive nutrition and investigate underlying cause.
	Dehydration	Tenting of the skin, sunken eyes, dry/tacky mucous membranes	Lack of access to fluid, disease, heat stress	Stabilise and treat underlying issues. Intra-osseous, I/P , S/C, I/V or oral fluid administration. . Diagnostic tests required prior to anaesthesia
	Ileus	No gut sounds, no recent faecal material	Chronic/acute stress or poor husbandry	Stabilise and treat underlying issues. Supportive feeding, gut stimulants etc. Diagnostic tests required prior to anaesthesia
	Dyspnoea	Respiratory movements become shallower +/-irregular, open mouth breathing or collapse	Airway obstruction or lungs compressed heat stress	Administer oxygen. Quiet, stress free environment.
	Stress and fear	Trying to hide, aggression, shaking and increased respiratory rate, regurgitation	Travel effects, handling, pain or physically compromised, unaccustomed to close human contact	Allow to calm down in a warm, darkened and quiet enclosure. Minimise handling. Avoid contact or close proximity to predator species. Investigate causes of pain or discomfort. Consider sedation.



During anaesthesia (anaesthetic equipment and heart rate should be checked first)	Reduced respiration	Respiratory movements become shallower +/-irregular	Airway obstruction or lungs compressed, reduced cardiac output, anaesthetic gases or drugs	Reduction, cessation or reversal of anaesthetic drugs. Oxygen provision and occasional chest compressions/IPPV and reflex stimulation e.g. toe pinch. Check positioning of patient e.g. rabbits and rodents = thorax slightly elevated. Ensure correct placement of ET tube. Mucolytics if excessive oral secretions (atropine or glycopyrrolate).
	Apnoea/ respiratory arrest	Respiratory movements cease, pale mucous membranes or cyanosis, poor or low reading on pulse oximeter.	Airway obstruction, lungs compromised, ET tube in too far (enter a single bronchus), hypercapnia, anaesthetic overdose	<ol style="list-style-type: none"> 1. Create a stimulus e.g. toe pinch or re-position 2. Turn off anaesthetic gases +/-or give reversible drugs 3. Attempt quick intubation or replace blocked ET tubes 4. Apply IPPV via ET tube or tight fitting mask, and gentle chest compressions or cranial-caudal rocking motion. 5. Apply Doxapram injection/drops 6. Check monitoring equipment and verify the situation by evaluating the patient.
	Dysrhythmia	Irregular heart rate (tachycardia/bradycardia) and rhythm	Disease, inappropriate or overdose of anaesthetic, pain or too close to consciousness. Severe blood loss (bradycardia)	If other reflexes and signs are stable it may be enough to report and record incident and carefully monitor for any further changes. If concerned ensure thermal and fluid therapy is sufficient and reverse anaesthetic drugs or commence recovery. Atropine/glycopyrrolate (if bradycardia).
	Cardiac arrest	Cessation of heart activity	Blood loss, Hypercapnia	<ol style="list-style-type: none"> 1. Apply gentle cardiac massage 2. Administer adrenaline via pre-placed I/V catheter or I/O needle 3. Crystalloid +/-or colloid or blood transfusion fluid therapy



During anaesthesia (anaesthetic equipment and heart rate should be checked first)	Drop in blood pressure	Regular readings show progressively or acute reduced values. May be accompanied by reduced cardiac output. Weak pulses.	Blood loss, length of anaesthesia, hypothermia.	Increase fluid rate and include colloid or blood transfusion where severe blood loss has occurred, provide additional heat support and carefully monitor temperature. Continue to monitor blood pressure
	Excessive salivation, mucoid or prophorin production	Crackling and fluid sounds from upper airway and possibly in the lungs. Rodents show red/brown prophrin discharge from eyes, nose and mouth	Stress or irritant response to anaesthetic gases, If occurring past the induction stage may suggest inadequate anaesthetic	Use non-noxious gas (such as Sevoflurane ®) in species predisposed to the reaction e.g rodents. Anticholinergic drugs to reduce secretions.
	Hypo / Hyperthermia	Thermometer probe readings increase or decrease in body temperature out with the species' range +/-or individual baseline parameters. Hypothermia = decrease in heart rate. Hyperthermia = increase in heart rate. Cold extremities and poor blood circulation (reduced CRT).	Severe blood loss; poor provision or monitoring of heat support	Check correct placement of thermometer probe, and battery life. Crystalloid +/-or colloid or blood transfusion fluid therapy. Heat therapy for hypothermia: External heat support, warm fluids etc. Heat therapy for hyperthermia: gently reduce external heat support.
	Seizures	Convulsions, rigidity of limbs, cardiac fluctuations may follow	Hypoglycaemia & Hypocalcaemia	Diazepam, Glucose or Ca EDTA administration, fluid therapy (concentration will depend on species and severity), reverse or turn off anaesthetic as soon as possible.
Recovery	Dyspnoea	Respiratory movements become shallower +/-irregular, open mouth breathing or collapse	Airway obstruction (e.g. bronchial secretions) or lungs compressed (poor handling/positioning techniques), heat stress	Immediate adjustment of handling/ positioning . Administer oxygen. Quiet stress free environment. Administer anticholinergic drugs (atropine/glycopyrrolate) to reduce secretions. Re-intubation and IPPV if required.

Recovery	Regurgitation or vomiting	Stomach contents visible in the mouth, fluid sounds during respiration, apnoea	Inadequate starve times, poor positioning or excessive manipulation of stomach	Hold head lower than the body; swab material out of mouth and use pipette/syringe to access narrow mouths such as rodents, rabbits and insectivores. Care particularly with unintubated patients; See 'apnoea' corrective strategies.
	Seizures	Convulsions, rigidity of limbs, cardiac fluctuations may follow	Hypoglycaemia & Hypocalcaemia	Diazepam, Glucose or Ca EDTA administration, fluid therapy (concentration will depend on species and severity), reverse or turn off anaesthetic as soon as possible.
	Anaemia	Pale mucous membranes, visible oozing or haemorrhage, prolonged recovery	Internal haemorrhage, stitches knots slipping or removed by patient, self-inflicted injury on excitable recovery (particularly wildlife). Low PCV - assessment if concerned but severity not immediately obvious	Immediate haemorrhage site compression. Re-anaesthetise for re-suturing or surgical repair. PCV assessments. Fluid loss replacement (crystalloid/colloids/blood transfusion). Administer local anaesthetic, bite-not or Elizabethan collars.
	Hypo / Hyperthermia	Thermometer probe readings increase or decrease in body temperature out with the species' range +/- or individual baseline parameters. Hypothermia = decrease in heart rate. Hyperthermia = increase in heart rate. Cold extremities and poor blood circulation (reduced CRT).	Severe blood loss; poor provision or monitoring of heat support	Check correct placement of thermometer probe, and battery life. Crystalloid +/- or colloid or blood transfusion fluid therapy. Heat therapy for hypothermia: External heat support, warm fluids etc. Heat therapy for hyperthermia: gently reduce external heat support.

Table 5.1. The most common problems encountered before, during and after anaesthesia of rabbit patients. Formulated from Longley & Bament, 2012; Fraser & Girling, 2009; Longley, 2008; Flecknell, 1996; Girling, 2003.